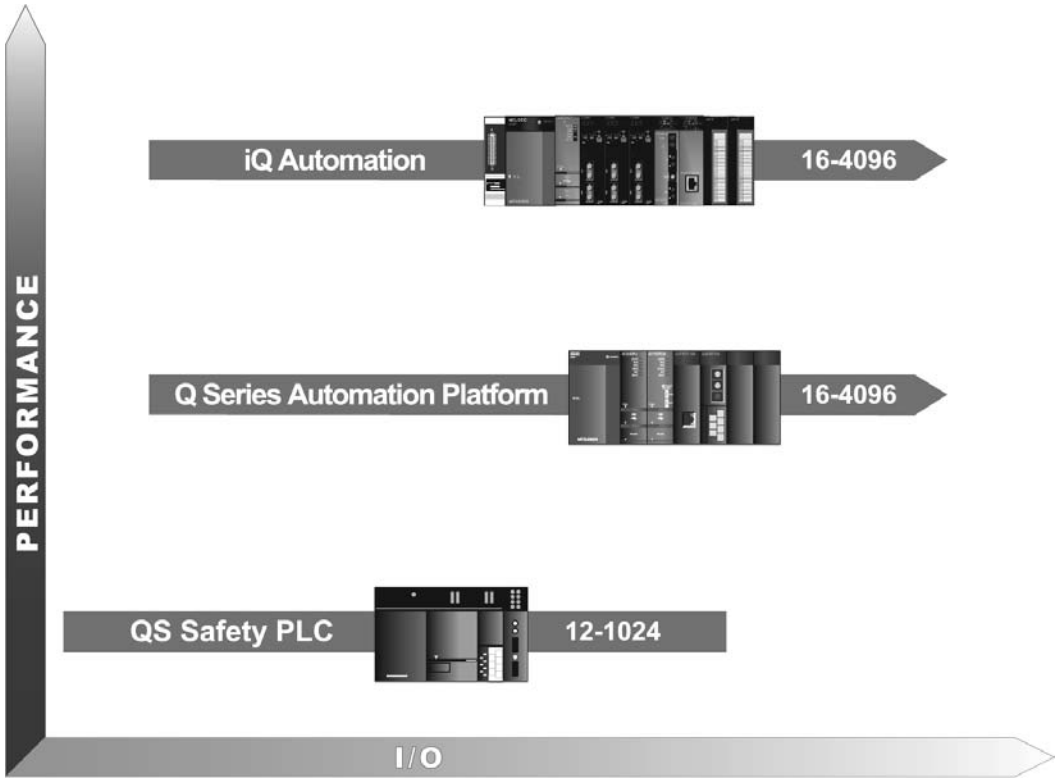
Rack-Based Controllers



iQ Platform **8**
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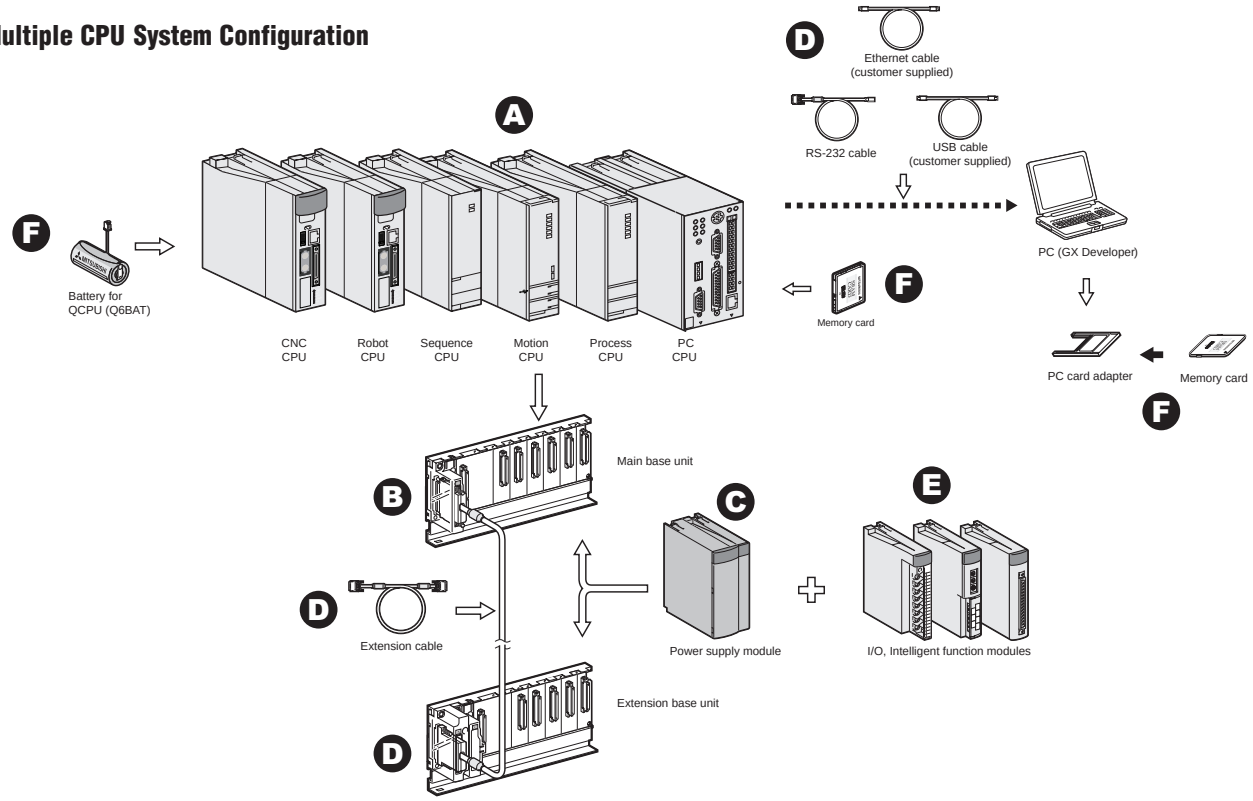
Stock Product: Stock product is product MEAU makes every effort to have on hand for immediate shipment. There may be instances when we are out of stock due to unexpected large requirements. All stock product will be indicated in this book by an "S" in the Stocked Item columns/rows.

Non-Stock Product: Non-stock product is product supplied on an "as-needed" basis. Standard lead times of 12 – 16 weeks apply, product is non-returnable and non-cancelable. Product listed as non-stock may change to stock product subject to increases in sales and usage. All non-stock product will be indicated in this book by a dash "–" in the Stocked Item columns/rows.

iQ Platform

Multiple CPU System Configuration



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The iQ Platform

The iQ Platform unifies all of the Mitsubishi Electric automation disciplines into a one-of-a-kind modular Programmable Automation Controller (PAC). Based on the multi-CPU architecture of the renowned Q Series Automation Platform, the iQ ultra high-speed dual-bus back plane allows the iQ to be the only PAC to integrate individual Sequence, Motion, CNC, and Robot control onto a single rack. The iQ Platform is ideal for multi-discipline systems, requiring at least one sequence CPU. Users can expand their configuration with existing Q Series I/O and intelligent modules, providing the iQ Platform customization flexibility without the cost of new development or double-stock.

Key Features:

- Up to 4 CPUs total, including one sequence CPU; motion, CNC, Robot CPUs available
- Large 4096 I/O capacity and as low as 9.5ns instruction processing, with selectable CPU program size
- Selectable built-in Ethernet sequence CPUs, enabling program upload/download, monitoring, debugging, SNTP, and FTP functionality via Ethernet
- Enhanced debugging features from within GX Developer
- Backward compatibility with Q Series programs and parameters
- Multiple program processing
- Selectable 8 or 32-axis high-speed fiber optic motion controller CPUs
- Selectable 16-axis C70 CNC controller CPU
- Selectable vertical or horizontal type robot controller CPUs
- Infinite I/O and intelligent function module customization possibilities
- Minimal hardware footprint
- Certified by UL, cUL, CE (as indicated), as well as DNV, ABS, RINA, BV, LR and NK shipping approvals for all Q Series products

High-Speed iQ Base Unit Compatibility

CPU Compatibility When Using the Multiple CPU High Speed iQ Base Unit (Q3•DB)		Basic Model CPUs (*1)		High Performance Model CPUs	Process CPUs	QPC CPU (*2, *7)	C CPU	QH Series Motion CPUs (*6, *7, *8)	iQ Motion CPUs (*3, *8)	QnU CPUs			CNC CPU (*9, *10)	Robot CPU (*12)
		Q00JCPU (*4)	Q00CPU Q01CPU	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q12PHCPU Q25PHCPU	PPC-852	Q06CCPU Q12DCCPU	Q172HCPU Q173HCPU	Q172DCPU Q173DCPU	Q02UCPU	Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q13UD(E)HCPU Q26UD(E)HCPU		Q173NCCPU-S01	Q172DRCPU
Basic Model CPUs (*1)	Q00JCPU (*4)	N	N	N	N	N	N	N	N	N	N		N	N
	Q00CPU Q01CPU	N	N	N	N	Y (*5)	Y (*5)	N	N	N	N		N	N
High Performance Model CPUs	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q25HCPU	N	N	Y (*5)	Y (*5)	Y (*5)	Y (*5)	N	N	N	Y (*5)		N	N
Process CPUs	Q12PHCPU Q25PHCPU	N	N	Y (*5)	Y (*5)	Y (*5)	Y (*5)	N	N	N	Y (*5)		N	N
QPC CPU (*2, *7)	PPC-852	N	Y (*5)	Y (*5)	Y (*5)	N	N	N	N	Y (*5)	Y		N	N
C CPU	Q06CCPU Q12DCCPU	N	Y (*5)	Y (*5)	Y (*5)	N	Y	N	N	Y	Y		N	N
QH Series Motion CPUs (*6, *7, *8)	Q172HCPU Q173HCPU	N	N	N	N	N	N	N	N	N	N		N	N
iQ Series Motion CPUs (*3, *8)	Q172DCPU Q173DCPU	N	N	N	N	N	N	N	N	N	Y		Y	Y
QnU CPUs	Q02UCPU	N	N	N	N	Y (*5)	Y	N	N	N	N		N	N
	Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q13UD(E)HCPU Q26UD(E)HCPU	N	N	Y (*5)	Y (*5)	Y	Y	N	Y	N	Y		Y	Y
CNC CPU (*9)	Q173NCCPU-S01 (*10)	N	N	N	N	N	N	N	Y	N	Y		Y	Y (*11)
Robot CPU (*12)	Q172DRCPU	N	N	N	N	N	N	N	Y	N	Y		Y (*11)	Y

Notes:

1. Basic model CPUs only support one of each CPU type in any given controller configuration.
2. Only one Q PC can be used in a system
3. Up to 3 iQ Series Motion CPUs can be used in a system.
4. Q00J does not support multiple CPUs.
5. Does not support dedicated inter-CPU communication bus
6. QH Series Motion CPUs (Q172H/Q173HCPU) cannot be used with High-Speed iQ Based Units (Q3□DB)
7. Q PC CPU cannot be used as CPU1.
8. Motion CPUs cannot be used as CPU1.
9. CNC CPU cannot be used as CPU1.
10. Up to 2 CNC CPUs can be used in a system, and they must be combined with at least 1 QnU CPU.
11. Must be combined with at least 1 QnU CPU.
12. Robot CPU cannot be used as CPU1.

Ⓐ iQ Platform CPUs

iQ Platform QnU "Universal" Sequence CPUs

The QnU CPUs bring high-end sequence control to the Mitsubishi PAC lineup and are required in every iQ system. These CPUs are most effective when used in conjunction with other iQ Platform CPUs such as Motion, Robot, CNC, PC and C Language controllers. However, they can also be used in Q Series configurations to increase performance and functionality.

Key Features:

- World-leading processor execution speeds as low as 9.5ns per instruction
- Significantly enhanced arithmetic and data processing (sorting, floating point, etc.)
- Vastly increased data storage and non-volatile program memory
- Utilizes dedicated high-speed CPU-only communication bus with other iQ CPUs
- Backward compatibility with Q Series CPUs, I/O and Intelligent Modules
- Built-in Ethernet port for increased accessibility and ease-of-use
- USB (Mini-B) connection to CPU for rapid program upload/download

Model Number		Standard	Q02UCPU	Q03UDCPU	Q04UDHCPU	Q06UDHCPU	Q13UDHCPU	Q26UDHCPU
		Built-In Ethernet	—	Q03UDECPU	Q04UDEHCPU	Q06UDEHCPU	Q13UDEHCPU	Q26UDEHCPU
Stocked Item			S	S	S	S	S	S
Control Method			Sequence program control method					
I/O Control Mode			Refresh mode					
Program Language	Sequence Control Language		Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, function block and structured text (ST)					
Processing Speed (Sequence Instruction)	LD X0		40ns	20ns	9.5ns			
	MOV D0 D1		80ns	40ns	19ns			
Constant Scan (Function For Keeping Regular Scan Time)			0.5 to 2000ms (Setting available in 0.5ms unit)					
Program Capacity (*1, *2)			20k steps (80k bytes)	30k steps (120k bytes)	40k steps (160k bytes)	60k steps (240k bytes)	130k steps (240k bytes)	260k steps (240k bytes)
Memory Capacity (*1)	Program Memory (Drive 0)		80k bytes	120k bytes	120k bytes	240k bytes	520k bytes	1040k bytes
	Memory Card (RAM) (Drive 1)		Capacity of the installed memory card (8M bytes max.)					
	Memory Card (ROM) (Drive 2)		Capacity of the installed memory card (Flash card: 4M bytes max., ATA card: 32M bytes max.)					
	Standard RAM (Drive 3)		128k bytes	192k bytes	256k bytes	768k bytes	1024k bytes	1280k bytes
	Standard ROM (Drive 4)		512k bytes	1024k bytes			2048k bytes	4096k bytes
	CPU Shared Memory (*3)	QCPU Standard Memory	8k bytes	8k bytes				
		Multiple CPU High Speed Trans. Area	—	32k bytes				
Max. Number of Files Stored	Program Memory		64	124			252 (*4)	
	Memory Card (RAM)		319 (When the Q3MEM-8MBS is used)					
	Memory Card (ROM)	Flash Card	288					
		ATA Card	511					
	Standard RAM		3					
	Standard ROM		128	256				
No. of Times of Writing Data Into The Program Memory			Max. 100,000 times (*5)					
No. of Times of Writing Data Into The Standard ROM			Max. 100,000 times (*6)					
No. of I/O Device Points			8192 points (X/Y0 to 1FFF)					
No. of I/O Points			2048 points (X/Y0 to 7FF)	4096 points (X/Y0 to FFF)				
No. of Device Points (*7)	Internal Relay [M]		8192 points by default (M0-8191) (changeable)					
	Latch Relay [L]		8192 points by default (L0-8191) (changeable)					
	Link Relay [B]		8192 points by default (B0 to 1FFF) (changeable)					
	Timer [T]		2048 points by default (T0 to 2047) (changeable) (Sharing of low- and high-speed timers) The low- and high-speed timers are specified by the instructions. The measurement unit of the low- and high-speed timers is set up by parameters. (Low-speed timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed timer: 0.1 to 100ms, 0.1ms unit, 10ms by default)					
	Retentive Timer [ST]		0 point by default (sharing of the low- and high-speed retentive timers) (changeable) The low- and high-speed retentive timers are specified by the instructions. The measurement unit of the low- and high-speed retentive timers is set up by parameters. (Low-speed retentive timer: 1 to 1000ms, 1ms unit, 100ms by default) (High-speed retentive timer: 0.1 to 100ms, 0.1ms unit, 10ms by default)					
	Counter [C]		Normal counter, 1024 points by default (C0 to 1023) (changeable)					
	Data Register [D]		12288 points by default (D0 to 12287) (changeable)					
	Link Register [W]		8192 points by default (W0 to 1FFF) (changeable)					
	Annunciator [F]		2048 points by default (F0 to 2047) (changeable)					
	Edge Relay [V]		2048 points by default (V0 to 2047) (changeable)					
	Link Special Relay [SB]		2048 points by default (SB0 to 7FF) (changeable)					
	Link Special Register [SW]		2048 points by default (SW0 to 7FF) (changeable)					

Notes:

1. The unit of the file size stored in the memory area varies depending on the CPU module. For more details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)
2. The maximum number of executable sequence steps is shown. (Program capacity) – (File header size (default: 34 steps)). For details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).
3. The CPU shared memory is not latched and is cleared when turning on the PLC or resetting the CPU module.
4. The CPU module can only execute up to 124 programs, though more may be stored.
5. The number of writes to the program memory can be checked by the special register (SD682 and SD683).
6. The number of writes to the standard ROM can be checked by the special register (SD687 and SD688).
7. The number of device points can be changed within a setting range. For more details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals).

iQ Platform QnU "Universal" Sequence CPUs (continued)

Model Number			Standard	Q02UCPU	Q03UDCPU	Q04UDHCPU	Q06UDHCPU	Q13UDHCPU	Q26UDHCPU
			Built-In Ethernet	—	Q03UDECPU	Q04UDEHCPU	Q06UDEHCPU	Q13UDEHCPU	Q26UDEHCPU
No. of Device Points	File Register [R] (*8)		Standard RAM	32768 points (R0 to 32767) Up to 65536 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 98304 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 131072 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 393216 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 524288 points can be used by block switching in units of 32768 points	32768 points (R0 to 32767) Up to 393216 points can be used by block switching in units of 32768 points
			SRAM card (1M Bytes)	32768 points (R0 to 32767) Up to 517120 points can be used by block switching in units of 32768 points					
			SRAM card (2M Bytes)	32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points					
			SRAM card (4M Bytes)	32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points					
			SRAM card (8M Bytes)	32768 points (R0 to 32767) Up to 4184064 points can be used by block switching in units of 32768 points					
			Flash card (2M Bytes)	32768 points (R0 to 32767) Up to 1041408 points can be used by block switching in units of 32768 points					
			Flash card (4M Bytes)	32768 points (R0 to 32767) Up to 2087936 points can be used by block switching in units of 32768 points					
	File Register [ZR]		Standard RAM	65536 points (ZR0 to 65535) Block switching not required.	98304 points (ZR0 to 98303) Block switching not required.	131072 points (ZR0 to 131071) Block switching not required.	393216 points (ZR0 to 393215) Block switching not required.	524288 points (ZR0 to 524287) Block switching not required.	655360 points (ZR0 to 655359) Block switching not required.
			SRAM Card (2M Bytes)	517120 points (ZR0 to 517119), Block switching not required.					
			SRAM Card (2M Bytes)	1041408 points (ZR0 to 1041407), Block switching not required.					
			SRAM Card (4M Bytes)	2087936 points (ZR0 to 2087935), Block switching not required.					
			SRAM Card (8M Bytes)	4184064 points (ZR0 to 4184063), Block switching not required.					
			Flash Card (2M Bytes)	1041408 points (ZR0 to 1041407), Block switching not required.					
			Flash Card (4M Bytes)	2087936 points (ZR0 to 2087935), Block switching not required.					
	Step Relay [S] (*9)			8192 points (S0 to 8191) The number of device points is fixed. (*10)					
	Index Register /Standard Device Register [Z]			max. 20 points (Z0 to 19)					
	Index Register [Z] (32-bit Modification Specification of ZR Device)			max. 10 points (Z0 to 18) (Index register (Z) is used in double words.)					
	Pointer [P]			4096 points (P0 to 4095), the use ranges of the local pointers and common pointers can be set up by parameters.					
	Interrupt Pointer [I]			256 points (I0 to 255) The constant cyclic interval of system interrupt pointers I28 to 31 can be set up by parameters. (0.5 to 1000ms, 0.5ms unit); Default values I28: 100ms, I29: 40ms, I30: 20ms, I31: 10ms					
	Special Relay [SM]			2048 points (SM0 to 2047) (The number of device points is fixed)					
	Special Register [SD]			2048 points (SM0 to 2047) (The number of device points is fixed)					
	Function Input [FX]			16 points (FX0 to F) (The number of device points is fixed)					
	Function Output [FY]			16 points (FY0 to F) (The number of device points is fixed)					
	Function Register [FD]			5 points (FD0 to 4) (The number of device points is fixed)					
Specs. Of Built-In Ethernet Port CPU Module (*11)	Data Transmission Speed			—	100/10Mbps				
	Communication Mode			—	Full-duplex / Half duplex				
	Ethernet Functions			—	Program upload/download, remote monitor/maintenance, HMI connection, FTP server, SNTP				
	Max. Distance Between Hub and Node			—	100m (328.08 feet)				
	Max. No. of Connectable Nodes	10BASE-T		—	Cascade connection: Four stages at maximum				
		100BASE-TX		—	Cascade connection: Two stages at maximum				
	Number of Connections (*12)			—	16 for MELSOFT connection and MC protocol, 1 for FTP				
Link Direct Device				Device for accessing the link device directly. Dedicated to CC-Link IE and MELSECNET/H. Specified form: J□□\X□□, J\Y□□, J□□\W□□, J□□\B□□, J□□\SW□□, J□□\SB□□					
Intelligent Function Module Device				Device for accessing the buffer memory of the intelligent function module directly. Specified form: U□□\G□□					
Latch Range				L0 to 8191 (8192 points by default) (Latch range can be set up for B, F, V, T, ST, C, D, and W.) Setting by parameters.					
RUN/PAUSE Contact				One contact can be set up in X0 to 1FFF for each of RUN and PAUSE. Setting by parameters.					
Timer Function				Year, month, date, hour, minute, second, and day-of-week (leap year automatically identified) Accuracy: -2.96 to +3.74s(TYP.+1.42s)/d at 0°C; Accuracy: -3.18 to +3.74s(TYP.+1.50s)/d at 25°C Accuracy: -13.20 to +2.12s(TYP.-3.54s)/d at 55°C					
Allowable Instantaneous Power Failure Period				Varies depending on the power supply module.					
5VDC Internal Current Consumption				0.23A	0.33A (*13)	0.39A (*14)			
External Dimensions (H x W x D) mm (in)				98 (3.86) x 27.4 (1.08) x 89.3 (3.52) (*15)					
Weight (kg)				0.20 (*15)					

Notes:
8. Read only when Flash card is used. ATA card is unusable.
9. Step relays are the devices for the DFC function.
10. For Universal model CPUs with serial numbers (first 5 digits) "10042" or later, step relays can be set to 0 step.
11. Applies to QnU CPUs with built-in Ethernet ports only.
12. Indicates the total number of TCP/IP and UDP/IP protocols.
13. The current value consumption of the Q03UDECPU is 0.46A
14. The current consumption of the Q04UDEHCPU, Q06UDEHCPU, Q13UDEHCPU and Q26UDEHCPU is 0.46A.
15. The values for the QnU CPUs with built-in Ethernet ports are as follows: Depth 115mm (4.53 in), Weight: 0.22kg.

iQ Platform Motion CPUs

The iQ Platform unifies four key fields of automation, one being servo motion. The iQ Motion CPUs combined with MR-J3 servos deliver the highest level of speed and precision with tight integration to interdisciplinary automation control. Exploiting the high-speed inter-CPU communication bus, servo movement can be scattered seamlessly throughout Sequence, Robot, and CNC operations.

Key Features:

- Accelerated communication speed over a freely designated expanded range of inter-CPU shared memory
- Additional clutch control functionality
- Faster processing for improved multi-axis support
- Up to 32 axes per CPU, 96 axes per system
- MR-J3-B Servo and SSCNETIII benefits, including noise free, 50Mbps, fiber optic communication, and active auto-tuning

Required Manuals

Model Number	Description	Included with CPU?	Stocked Item
IB(NA)0300133-A	QD Users Manual	No	S
IB(NA)0300134-A	QD Common Manual	No	S
IB(NA)0300136-A	QD Real Mode Manual	No	S
IB(NA)0300137-A	QD Virtual Mode Manual	No	S
IB(NA)0300135-A	QD SFC Programming Manual	No	S

Note: Many of these manuals are available by free download from our website, www.meau.com

Model Number		Q173DCPU	Q172DCPU
Stocked Item		S	S
Number Of Control Axes		Up to 32 axes	Up to 8 axes
Operation Cycle (Default)	SV13	0.44ms/1 to 6 axes 0.88ms/7 to 18 axes 1.77ms/19 to 32 axes	0.44ms/1 to 6 axes 0.88ms/7 to 8 axes
	SV22	0.44ms/1 to 4 axes 0.88ms/5 to 12 axes 1.77ms/13 to 28 axes 3.55ms/29 to 32 axes	0.44ms/1 to 4 axes 0.88ms/ 5 to 8 axes
Interpolation Functions		Linear interpolation (Up to 4 axes), Circular interpolation (2 axes), Helical interpolation (3 axes)	
Control Modes		PTP (Point to Point) control, Speed control, Speed-position control, Fixed-pitched feed, Constant speed control, Position follow-up control, Speed control with fixed position stop, Speed switching control, HIgh-speed oscillation control, Synchronous control (SV22)	
Acceleration/ Deceleration Control		Automatic trapezoidal acceleration/deceleration, S-curve acceleration/deceleration	
Compensation		Backlash compensation, Electronic gear, Phase compensation (SV22)	
Programming Language		Motion SFC, Dedicated instruction, Mechanical support language (SV22)	
Servo Program Capacity		14k steps	
Number Of Positioning Points		3200 points (Positioning data can be designated indirectly)	
Peripheral I/F		Via sequence CPU (USB/RS-232)	
Home Position Return Function		Proximity dog type (2 types), Count type (3 types), Data set type (2 types), Dog cradle type, Stopper type (2 types), Limit switch combined type (Home position return re-try function provided, home position shift function provided)	
JOG Operation Function		Provided	
Manual Pulse Generator Operation Function		Possible to connect 3 modules	
Synchronous Encoder Operation Function		Possible to connect 12 modules	Possible to connect 8 modules
M-Code Function		M-code output function provided. M-code completion wait function provided	
Limit Switch Output Function		Number of output points 32 points. Watch data: Motion control data/Word device	
Absolute Position System		Made compatible by installing battery in servo amplifier. (Possible to select the absolute data method or incremental method for each axis)	
Number of SSCNET III Systems (*1)		2 systems	1 system
Motion Related Interface Module		Q172DLX : 4 modules usable Q172DEX : 6 modules usable Q173DPX : 4 modules usable (*2)	Q172DLX : 1 module usable Q172DEX : 4 modules usable Q173DPX : 3 modules usable (*2)
Internal Current Consumption (5VDC) [A]		1.25	1.14
Mass (kg)		0.33	0.33
Exterior Dimensions mm (inch) HxWxD		98 (3.85) x 27.4 (1.08) x 119.3 (4.69)	

Notes:
1. The servo amplifiers for SSCNET cannot be used.
2. When using the incremental synchronous encoder (SV22 use), you can use above number of modules. When connecting the manual pulse generator, you can use only 1 module.

Model Number				Q173DCPU/Q172DCPU
Motion SFC Program Capacity	Code Total (Motion SFC Chart + Operation Control + Transition)			543k bytes
	Text Total (Operation Control + Transition)			484k bytes
Motion SFC Program	Number Of Motion SFC Programs			256 (No. 0 to 255)
	Motion SFC Chart Size / Program			Up to 64k bytes (Included Motion SFC chart comments)
	Number Of Motion SFC Steps/Program			Up to 4094 steps
	Number Of Selective Branches/Branch			255
	Number Of Parallel Branches/Branch			255
	Parallel Branch Nesting			Up to 4 levels
Operation Control Program (F/FS) / Transition Program (G)	Number Of Operation Control Programs			4096 with F (Once execution type) and FS(Scan execution type) combined. (F/FS0 to F/FS4095)
	Number Of Transition Programs			4096 (G0 to G4095)
	Code Size / Program			Up to approx. 64K bytes (32766 steps)
	Number Of Blocks(Line) / Program			Up to 8192 blocks (in the case of 4 steps(min)/blocks)
	Number Of Characters / Block			Up to 128 (comment included)
	Number Of Operand / Block			Up to 64 (operand: constants, word device, bit devices)
	Nesting/Block			Up to 32 levels
	Descriptive Expression	Operation Control Program		Calculation expression/bit conditional expression
		Transition Program		Calculation expression/bit conditional expression/comparison conditional expression
Execute Specification	Number Of Multi Execute Programs			Up to 256
	Number Of Multi Active Steps			Up to 256 steps/all programs
	Executed Task	Normal Task		Execute in main cycle of Motion CPU
		Event Task (Execution Can Be Masked)	Fixed Cycle	Execute in fixed cycle (0.88ms, 1.77ms, 3.55ms, 7.11ms, 14.2ms)
			External Interrupt	Execute when input ON is set among interrupt module QI60 (16 points)
			PLC Interrupt	Execute with interrupt instruction (D(P).GINT) from sequence CPU.
		NMI Task		Execute when input ON is set among interrupt module QI60 (16 points).

Synchronous Encoder

Type	Synchronous Encoder		Manual Pulse Generator
	Serial Absolute	Incremental	
Model Number	Q172DEX	Q173DPX	
Stocked Item	S	S	
Q173DCPU	12 modules	12 modules	3 modules
Q172DCPU	8 modules	8 modules	3 modules

iQ Platform CNC CPUs

The Q173NCCPU enables entry level CNC Control to be integrated with Sequence, Motion, and Robot automation systems. Also known as the C70 Series CNC Controller, an iQ CNC CPU system uses multi-purpose GOT1000 HMIs and on-rack I/O cards to minimize TCO on CNC line solutions.

Key Features:

- Accelerated communication speed over the inter-CPU shared memory
- Up to 16 axes with 4 simultaneously controlled axes per CPU, 2 CPUs per system
- 16.8k Block/min processing speed
- Streamlined production with reduced Tact Time and host information system linkage
- Uses GOT1000 HMI and iQ rack-based I/O card interfaces
- SSCNETIII benefits, including noise free, 50Mbps, fiber optic communication

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stocked Item
IB1500261(ENG)E	C70 Connection Manual	Covers Q173NCCPU installation and connections	Yes (PDF format)	–
IB1500267(ENG)C	C70 Instruction Manual	Covers screen operation for C70	Yes (PDF format)	–
IB1500263(ENG)D	C70 PLC Interface Manual	Describes the various signal interfaces and functions required when creating sequence program of PLC CPU to operate C70	Yes (PDF format)	–
IB1500269(ENG)B	C70 Programming Manual (Machining Center System)	Covers programming for machining centers	Yes (PDF format)	–
IB1500275(ENG)B	C70 Programming Manual (Lathe System)	Covers programming for lathe systems	Yes (PDF format)	–
IB1500265(ENG)G	C70 Setup Manual	Covers setup	Yes (PDF format)	–
IB1500259(ENG)C	C70 CPU Module Q173NCCPU Specifications Manual	General and functional specifications	Yes (PDF format)	–

CNC CPU Specifications	Q173NCCPU-S01	
	Machining Center Type	Lathe Type
Stocked Item	S	S
Number Of Control Axes	16	
Maximum Number Of Simultaneous Control Axes	4	
Maximum Number Of Spindles	7	4
Maximum Number Of PLC Axes	7	
Maximum Number Of Phase Systems	7	3
Control Unit	1µm / 0.1µm	
Interpolation Processing Performance	16.8k Block/min	
Max Feed Rate	1000m/min	

iQ Platform Robot CPUs

The new Q172DRCPU Robot controller combines faster processing speed and enhanced motion control, providing superior flexibility and performance when designing robotic work cells.

Key Features:

- Capable of controlling up to 3 robots per system
- Both vertically articulated and SCARA robots can be configured on a single platform
- Single programming software package for all robot types
- Versatility through shared iQ networking, I/O, and intelligent modules
- Improved cycle times through inter-CPU shared memory bus

Vertically Articulated Robots for iQ

Model Number (*1, *2)	Axes / Degrees of Freedom	Max. Payload (kg)	Max. Reach Radius (mm)	Position Repeatability (mm)	Stocked Item
RV-3SQJ-☐	5	3.5	641	± .02	—
RV-3SQ-☐	6	3.5	642	± .02	—
RV-6SQ-☐	6	6	695	± .02	—
RV-6SQL-☐	6	6	902	± .02	—
RV-12SQ-☐	6	12	1086	± .05	—
RV-12SQL-☐	6	12	1385	± .05	—

Notes:
1. Includes arm, drive unit, CPU, arm to drive unit cable set, and CPU to drive unit cable set.
2. -☐ Indicates additional specifications for UL, clean, and oil mist types. Please consult with MEAU

SCARA Robots for iQ

Model Number (*1, *2)	Axes / Degrees of Freedom	Max. Payload (kg)	Max. Reach Radius (mm)	Z Axis Stroke (mm)	Position Repeatability			Stocked Item
					X-Y Composite (mm)	Z (mm)	(deg.)	
RH-6SQH3520-☐	4	6	350	200		± .01	± .02	—
RH-6SQH4520-☐	4	6	450	200		± .01	± .02	—
RH-6SQH5520-☐	4	6	550	200		± .01	± .02	—
RH-12SQH5535-☐	4	12	550	350	± .02	± .01	± .03	—
RH-12SQH7035-☐	4	12	700	350	± .025	± .01	± .03	—
RH-12SQH8535-☐	4	12	850	350	± .025	± .01	± .03	—
RH-18SQH8535-☐	4	18	850	350	± .025	± .01	± .03	—

Notes:
1. Includes arm, drive unit, CPU, arm to drive unit cable set, and CPU to drive unit cable set.
2. -☐ Indicates additional specifications for UL, clean, and oil mist types. Please consult with MEAU

Options for iQ Robots

	Model Number	Description	Notes	Stocked Item
Teach Pendants	R32TB	Standard Teach Pendant, 7m cable	Basic Teaching and Operation	S
	R32TB-15	Standard Teach Pendant 15m cable	Basic Teaching and Operation	S
	R56TB	Enhanced Teach Pendant 7m cable	Advanced Function Pendant	S
	R56TB-15	Enhanced Teach Pendant 15m cable	Advanced Function Pendant	S
Software	RT-TOOLBOX2-C1	Robot Programming and Setup SW-Light Version	Without Simulation Tool	S
	RT-TOOLBOX2-LT-C1	Robot Programming and Setup SW	With Simulation Tool	S
	MELFA-VISION-C1	Vision Interface and Setup SW Tool	Compatible with Cognes "In-Sight" sensors	S
	MELFA-WORKS-C1	Advanced Design and Integration SW Tool	Add on to Solid Works Required	S
Hand Interface Card	2A-RZ365	Pneumatic hand interface	Sink Type	S
	2A-RZ375	Pneumatic hand interface	Source Type	S
Solenoid * Valve Sets	1S-VD0x☐-02	1 Valve Set with Output Cable	RV-3 / RV-6	S
	1S-VD0x☐-01	1 Valve Set with Output Cable	RV-12	S
	1S-VD0xM☐-04	1 Valve Set with Output Cable	RH-6	S
	1S-VD0xM☐-03	1 Valve Set with Output Cable	RH-12 / RH-18	S
Hand I/O Cables	1S-GR35S-01	Hand Output Cable	4-Connection, RV-3, 6, 12	S
	1S-HC25C-01	Hand Input Cable	8-Connection, RV-3, 6, 12	S
	1S-GR35S-02	Hand Output Cable	4-Connection, RH	S
	1S-HC35C-02	Hand Input Cable	8-Connection, RH	S
Hand Curl Tube	1N-ST0602C	φ6 - 1 Connection	RV-12	S
	1N-ST0604C	φ6 - 2 Connections	RV-12	S
	1N-ST0606C	φ6 - 3 Connections	RV-12	S
	1N-ST0608C	φ6 - 4 Connections	RV-12, RH-6/12/18	S
	1E-ST0402C	φ4 - 1 Connection	RV-3/6	S
	1E-ST0404C	φ4 - 2 Connections	RV-3/6	S
	1E-ST0406C	φ4 - 3 Connections	RV-3/6	S
	1E-ST0408C	φ4 - 4 Connections	RV-3/6	S
	1E-ST0408C-300	φ4 - 4 Connections, 300 mm	RH-6	S

***Notes:** x = number of valves (1-4) ; ☐ = connection type, E = Source, No symbol represents Sink

Ⓑ iQ Platform Base Units

The high speed iQ base units utilize a secondary inter-CPU bus to share more data at faster speeds between up to 4 iQ CPUs. Non-iQ CPUs may be used on the base unit, but will not increase in performance.

Base Units

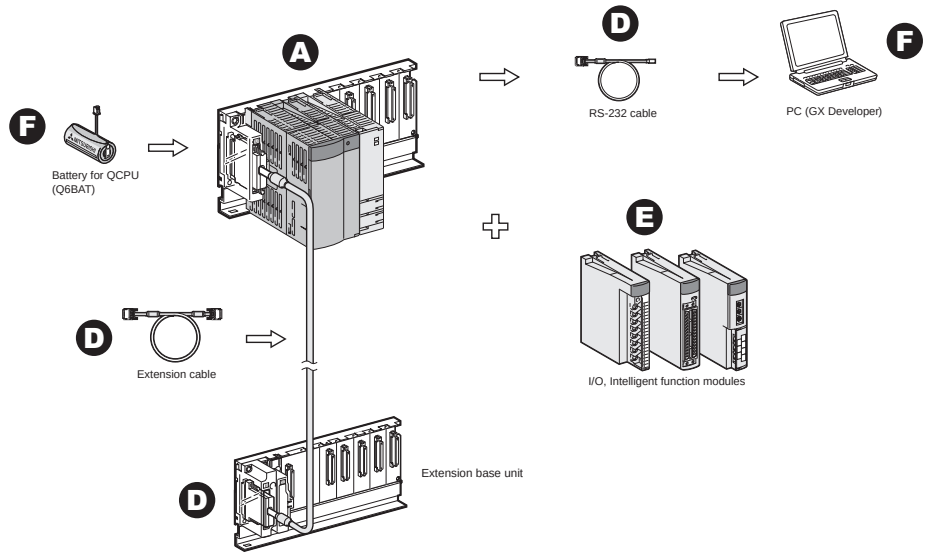
Model Number	Q38DB	Q312DB
Stocked Item	S	S
Certification	UL • cUL • CE	
Number of Slots	8	12
Applicable I/O and Intelligent Function Modules	Q Series/iQ modules	
Mounting Hole Size	5mm keyhole (for M4 screw)	
Dimension (W x H) mm (in)	328 (12.92) x 98 (3.86)	439 (17.30) x 98 (3.86)
Weight (kg)	0.41	0.54
Accessories	4- M4 x 14 base unit mounting screws	

DIN Rail Mounting Adapters

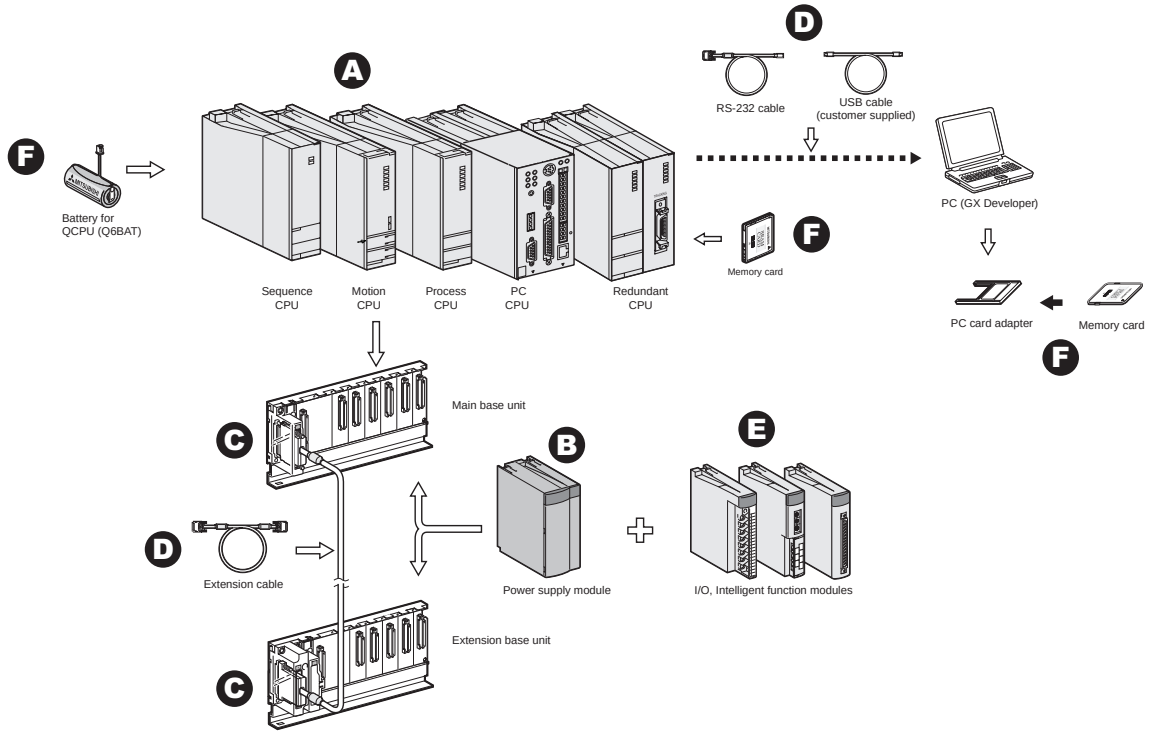
Model Number	Applicable Base or Extension Base	Stocked Item
Q6DIN1	Q38DB, Q312DB	S

Q Series

Single CPU System Configuration (Q00JCPU)



Multiple CPU System Configuration



A. CPUs 17
B. Base Units 29
C. Power Supply Modules.....30
D. Extension Base Units and Connection Cables 31
E. Special Function Modules 32
F. Accessories 72

Standard Base Unit Compatibility

CPU Compatibility When Using the Multiple CPU Q Base Unit (Q3•B)		Basic Model CPUs (*1)		High Performance Model CPUs	Process CPUs	QPC CPU (*2, *7)	C CPU	QH Series Motion CPUs (*8)	iQ Series Motion CPUs (*3)	QnU CPUs (9*)		CNC CPU (*5)	Robot CPU (*5)
		Q00JCPU (*4)	Q00CPU Q01CPU	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q12PHCPU Q25PHCPU	PPC-852	Q06CCPU Q12DCCPU	Q172HCPU Q173HCPU	Q172DCPU Q173DCPU	Q02UCPU	Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q13UD(E)HCPU Q26UD(E)HCPU	Q173NCCPU-S01	Q172DRCPU
Basic Model CPUs (*1)	Q00JCPU (*4)	N	N	N	N	N	N	N	N	N	N	N	N
	Q00CPU Q01CPU	N	N	N	N	Y	Y	Y	N	N	N	N	N
High Performance Model CPUs	Q02CPU Q02HCPU Q06HCPU Q06HCPU Q12HCPU Q25HCPU	N	N	Y	Y	Y	Y	Y	N	N	Y	N	N
Process CPUs	Q12PHCPU Q25PHCPU	N	N	Y	Y	Y	Y	Y	N	N	Y	N	N
QPC CPU (*2, *7)	PPC-852	N	Y	Y	Y	N	N	Y	N	Y	Y	N	N
C CPU	Q06CCPU Q12DCCPU	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	N
QH Series Motion CPUs (*8)	Q172HCPU Q173HCPU	N	Y	Y	Y	Y	Y	Y	N	Y (*6)	Y	N	N
iQ Series Motion CPUs (*8)	Q172DCPU Q173DCPU	N	N	N	N	N	N	N	N	N	N	N	N
QnU CPUs	Q02UCPU	N	N	N	N	Y	Y	Y (*6)	N	N	N	N	N
	Q03UD(E)CPU Q04UD(E)HCPU Q06UD(E)HCPU Q13UD(E)HCPU Q26UD(E)HCPU	N	N	Y	Y	Y	Y	Y	N	N	Y	N	N
CNC CPU (*5)	Q173NCCPU-S01	N	N	N	N	N	N	N	N	N	N	N	N
Robot CPU (*5)	Q172DRCPU	N	N	N	N	N	N	N	N	N	N	N	N

Notes:
1. Basic model CPUs only support one of each CPU type in any given controller configuration.
2. Only one Q PC can be used in a system
3. iQ Series Motion CPUs cannot be used with Q Base units (Q3*B).
4. Q00J does not support multiple CPUs.
5. CNC and Robot CPUs can not be used with Q Base Units (Q3*B).
6. Q02UCPU can only be used with one Q17nHCPU.
7. Q PC CPU cannot be used as CPU1.
8. Motion CPUs cannot be used as CPU1.
9. Does not support dedicated inter-CPU communications bus.

The MELSEC Q Series Automation Platform

Q Series PACs are multi-disciplinary automation platforms addressing the needs of both OEMs and end users. The Q Series is the original multi-CPU system, with up to 4 CPUs to divide-and-conquer larger applications. It provides scalable automation solutions to both small and very large systems, offering a broad spectrum of automation capabilities. Additional CPUs and intelligent function module expansions allow the Q series to handle sophisticated motion, process control, PC and C language based control, MES IT interfacing, and numerous types of communication and networking.

Key Features:

- CPU types ranging from small/medium systems, to complex networked systems with tens of thousands of I/O
- Reduced lifecycle costs via remote system management & maintenance
- Redundant CPU capability available for hot-backup of critical systems
- Multiple CPU capability (up to 4 CPUs) adding open ended system performance and flexibility
- Multiple programs allowing concurrent development, code reuse, better program organization and faster troubleshooting for less downtime
- Multiple simultaneous access to the system allowing for faster system debugging and maintenance
- Networking & communication options distribute Q Series systems over wide areas while reducing wiring costs
- Sequence CPUs can also address process applications by means of built-in PID capabilities
- Extremely compact package saves panel costs
- Certified by UL, cUL, CE (as indicated), as well as DNV, ABS, RINA, BV, LR and NK shipping approvals for all Q Series products

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
IB(NA)0800061	QCPU(Q mode) CPU Module User's Manual (Hardware)	General specs, CE compliance information, Installation, safety requirements, Power supply wiring, overview of system parts	No (included with base units)	–
SH(NA)080483ENG	Q CPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	CPU H/W specs, PSU spec, Base Unit specs, CE compliance information, Maintenance & inspection, Installation, Troubleshooting	No (purchase separately)	–
SH(NA)080484ENG	QCPU(Q Mode) User's Manual (Function Explanation, Program Fundamentals)	CPU specifications, system configuration, programming basics, I/O assignments, memory organization, CPU functions, communication with intelligent function modules, parameters & devices, program up/downloads, overview of multiple program architecture, programming basics, overview of multiple CPU system	No (purchase separately)	–
SH(NA)080485ENG	QCPU User's Manual (Multiple CPU System)	Outline, system configuration, concept for multiple CPU system, communication between CPU modules, processing time of QCPU in multiple CPU system, parameter added for multiple CPU system, precautions for use of AnS Series module, starting up the multiple CPU system	No (purchase separately)	–
SH(NA)080039	QCPU(Q Mode)/QnACPU Programming Manual (Common Instructions)	General Description, Instruction Tables, Configuration of Instructions, How To Read Instructions, Sequence Instructions, Basic Instructions, Application Instructions, Instructions For Data Link, QCPU Instructions, Redundant System Instructions, Error Codes	No (purchase separately)	–
SH(NA)080041	QCPU(Q Mode)/QnACPU Programming Manual (SFC)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	–
SH(NA)080076	Q CPU (Q Mode) Programming Manual (MELSAP-L)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	–
SH(NA)080040	QCPU(Q Mode)/QnACPU Programming Manual (PID Control Instructions)	General Description, System Configuration for PID Control, PID Control Specifications, Functions of PID Control, PID Control Procedure, PID Control Instructions, How To Read Explanations For Instructions, Incomplete Derivative PID Control Instructions and Program Examples, Complete Derivative PID Control Instructions and Program Examples	No (purchase separately)	–
SH(NA)080366	Programming Guide Book for Structured Text (ST)	Covers Structured Text programming method	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

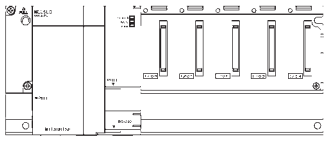
Ⓐ MELSEC Q Series CPUs

Basic Model Sequence CPUs

These CPUs offer an economical entry-level version of the Q Series for small scale systems.

Key Features:

- Multiple CPU support; use up to three CPUs to combine sequence, process, motion & PC control on a single system (Version B or later)
- Compatible with Q Series Intelligent Function Utility configuration tools
- Offers full range of Q Series network & communication features, including CC-Link IE 100Mbit Ethernet, MELSECNET/H
- Integrated PSU, CPU and base unit available to simplify system construction with Q00JCPUs



- Built in serial communications via CPU port (using MELSEC Communication (MC) protocol)
- Security functions
- Flash memory for programs & parameters
- Supports floating point, function block, PID and SFC programming (Version B or later)

MELSEC Q Series Basic Sequence CPU

Model Number		Q00JCPU-E	Q00JCPU-S8 (*5)	Q00CPU	Q01CPU
Stocked Item		S	S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Hardware Format		Combined CPU, PSU and 5-Slot Base Unit	Combined CPU, PSU and 8 slot Base Unit	CPU only	CPU only
Control Method		Repeated operation using stored program			
I/O Control Method		Refresh mode			
Programming Language (Sequence Control Dedicated Language)		Relay symbol type (ladder) logic symbolic language (list)			
Processing Speed (Sequence Instruct)	LD X0	200ns		160ns	100ns
	MOV (MOV D0 D1)	700ns		560ns	350ns
Total Number of Instructions		249 (excluding intelligent function module dedicated instructions)			
Constant Scan (ms) (Program Start at Given Time Intervals)		1 to 2000ms (can be specified in 1ms increments)			
Program Capacity (*1)		8k steps (32 kbyte)		8k steps (32 kbyte)	14k steps (56 kbyte)
Memory Capacity	Program Memory (Drive 0)	58 kbyte		94 kbyte	
	Standard RAM (Drive 3)	0		128 kbyte	
	Standard ROM (Drive 4)	58 kbyte		94 kbyte	
Number of Stored Programs	Program Memory	1	1	1	1
	Standard ROM	1	1	1	1
Number of Stored File Registers	Standard RAM	—	—	1	1
Number of I/O Device Points		2048 points (X/Y0 to 7FF) (*2)			
Number of I/O Points		256 points (X/Y0 to FF)		1024 points (X/Y0 to 3FF) (*3)	
Internal Relay [M]		Default 8192 points (M0 to 8191)			
Latch Relay [L]		2048 points (L0 to 2047)			
Link Relay [B]		2048 points (B0 to 7FF)			
Timer [T]		Default 512 points (T0 to 511) (used as low-speed or high-speed timer) Switching between low-speed and high-speed timers is set by instruction Low-speed/high-speed timer timing increments are parameter-set (Low-speed timer: 1 to 1000ms, 1ms increments, default 100ms) (High-speed timer: 0.1 to 100ms, 0.1ms increments, default 10ms)			
Retentive Timer [ST]		Default 0 point (ST0 to 511) (used as low-speed or high-speed timer) Switching between low-speed and high-speed timers is set by instruction Low-speed/high-speed timer timing increments are parameter-set. (Low-speed timer: 1 to 1000ms, 1ms increments, default 100ms) (High-speed timer: 0.1 to 100ms, 0.1ms increments, default 10ms)			
Counter [C]		Normal counters Default 512 points (C0 to 511) Interrupt counters Max. 128 (Default 0 points, parameter setting)			
Data Register [D]		Default 11136 points (D0 to 11135)			
Link Register [W]		Default 2048 points (W0 to 7FF)			
Annunciator [F]		Default 1024 points (F0 to 1023)			
Edge Relay [V]		Default 1024 points (V0 to 1023)			
File Register	[R]	None		32768 points (R0 to 32767)	
	[ZR]	None		65536 points (ZR0 to 65535)	
Special Link Relay [SB]		1024 points (SB0 to 3FF)			
Special Link Register [SW]		1024 points (SW0 to 3FF)			
Step Relay (*4)		2048 points (SW0 to 3FF)			
Index Register [Z]		10 points (Z0 to 9)			
Pointer [P]		300 points (P0 to 299)			
Interrupt Pointer [I]		128 points (I0 to 127) In parameters, set the cyclic intervals of the system interrupt pointers I28 to I31 (2 to 1000ms, 1ms increments)			
Special Relay [SM]		1024 points (SM0 to 1023)			
Special Register [SD]		1024 points (SD0 to 1023)			
Function Input [FX]		16 points (FX0 to F)			
Function Output [FY]		16 points (FY0 to F)			
Function Register [FD]		5 points (FD0 to 4)			
Link Direct Device		Device for direct access to link device. Dedicated. Specified format: J□□\□□			
Intelligent Function Module Direct Device		Device for direct access to buffer memory of intelligent function module. Specified format: U□□\G□□			
Latch (Power Failure Comp.) Range		L0 to 2047 (default) (Latch range setting can be made for B, F, V, T, ST, C, W and D)			
Remote RUN/PAUSE Contact		1 point can be set for each RUN and PAUSE contacts from X0-7FF.			
Clock Function		Year, month, day, hour, minute, second, day of week (Automatic leap year judgment) Accuracy –3.2 to +5.27 (TYP +1.98) s/day at 0°C Accuracy –2.57 to +5.27 (TYP +2.22) s/ day at 25°C Accuracy –11.68 to +3.65 (TYP –2.64) s/ day at 55°C			
Permissible Instantaneous Power Failure Time		20ms		Depends on power supply module	
5VDC Internal Current Consumption (A)		0.26		0.25	0.27
Weight (kg)		0.66		0.13	
Dimensions W x H x D mm (in)		245 (9.65) x 98 (3.86) x 98 (3.86)	328 (12.92) x 98 (3.86) x 98 (3.86)	27.4 (1.08) x 98 (3.86) x 89.3 (3.52)	

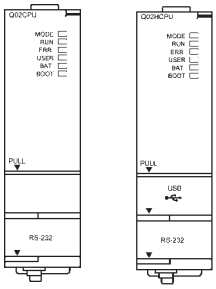
Notes:

1. Maximum actual program size is (program capacity—34 steps).
2. Sum of the number of I/O points on the main/extension base directly controlled by the CPU module and the number of I/O points controlled as remote I/O by the remote I/O network.
3. Number of I/O points on the main/extension base directly controlled by the CPU module.
4. The "Step relay" is a device for the SFC function, only applicable to version B CPUs or higher.
5. Q00JCPU-S8 has the same functionalities as Q00JCPU-E.

MELSEC Q Series High Performance Sequence CPUs

Key Features:

- Multiple CPU support; use up to four CPUs to combine sequence, process, motion & PC control on a single system in any combination
- Multiple program capability; allows up to 124 separate programs, depending on CPU type
- Multiple access to CPUs by several technicians simultaneously
- Very broad range of CPU capabilities
- Very high speed processing capability
- USB (Type B) connection to CPU for rapid upload/download of programs
- Up to 32MB of data storage by use of removable memory cards
- Supports floating point, PID and SFC programming
- Increased functionality in Version B or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function



Required Manuals

Model Number	Description	Contents	Included with CPU?	Stocked Item
IB(NA)0800061	QCPU(Q mode) CPU Module User's Manual (Hardware)	General specs, CE compliance information, Installation, Safety requirements, Power supply wiring, Overview of system parts	No (included with base units)	–
SH(NA)080483ENG	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	CPU H/W specs, PSU specs, Base Unit specs, Memory Card specs, CE compliance information, Installation, Maintenance & inspection, Troubleshooting	No (purchase separately)	–
SH(NA)080484ENG	QCPU(Q Mode) User's Manual (Function Explanation, Program Fundamentals)	CPU specifications, System configuration, Programming basics, I/O assignments, Memory organization, CPU functions, Communication with intelligent function modules, Parameters & devices, Program up/downloads, Overview of multiple program architecture, Programming basics	No (purchase separately)	–
SH(NA)080485ENG	QCPU User's Manual (Multiple CPU System)	Outline, system configuration, concept for multiple CPU system, communication between CPU modules, processing time of QCPU in multiple CPU system, parameter added for multiple CPU system, precautions for use of AnS Series module, starting up the multiple CPU system	No (purchase separately)	–
SH(NA)080039	QCPU(Q Mode)/QnACPU Programming Manual (Common Instructions)	General Description, Instruction Tables, Configuration of Instructions, How To Read Instructions, Sequence Instructions, Basic Instructions, Application Instructions, Instructions For Data Link, QCPU Instructions, Redundant System Instructions, Error Codes	No (purchase separately)	–
SH(NA)080041	QCPU(Q Mode)/QnACPU Programming Manual (SFC)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	–
SH(NA)080076	Q CPU (Q Mode) Programming Manual (MELSAP-L)	General Description, System Configuration, Specifications, SFC Program Configuration, SFC Program Processing Sequence, SFC Program Execution	No (purchase separately)	–
SH(NA)080040	QCPU(Q Mode)/QnACPU Programming Manual (PID Control Instructions)	General Description, System Configuration for PID Control, PID Control Specifications, Functions of PID Control, PID Control Procedure, PID Control Instructions, How To Read Explanations For Instructions, Incomplete Derivative PID Control Instructions and Program Examples, Complete Derivative PID Control Instructions and Program Examples	No (purchase separately)	–
SH(NA)080368	Programming Guide Book for Structured Text (ST)	Covers Structured Text programming method	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

MELSEC Q Series High Performance Sequence CPUs

Model Number			Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Stocked Item			S	S	S	S	–
Certification			UL• cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Control System			Repeated operation using stored program				
I/O Control Method			Refresh mode				
Programming Language			Language dedicated to sequence control Relay symbol type (ladder), logic symbolic language				
Processing Speed (Sequence Instruc.)	LD (LD X10)		79ns	34ns			
	MOV (MOV D0 D1)		237ns	102ns			
Total Number of Instructions			360 (excluding intelligent function module dedicated instructions)				
Constant Scan (Program Start at Given Time Intervals)			0.5 to 2000ms (can be specified in 0.5ms increments)				
Program Capacity	Program Memory (Drive 0)		28k steps	28k steps	60k steps	124k steps	252k steps
Memory Capacity	Memory Card (RAM) (Drive 1)		Capacity of loading memory cards (2 Mbyte max.)				
	Memory Card (ROM) (Drive 2)		Installed memory card capacity (Flash card: 4 Mbyte max., ATA card: 32 Mbyte max.)				
	Standard RAM (Drive 3)		64 kbyte	128 kbyte	128 kbyte	256 kbyte	256 kbyte
	Standard ROM (Drive 4)		112 kbyte	112 kbyte	240 kbyte	496 kbyte	1008 kbyte
	CPU Shared Memory		8 kbyte (not latched)				
Maximum Number Of Stored Files	Program Memory		28	28	60	124	252
	Memory Card (RAM)		287				
	Memory Card (ROM)	Flash	288				
		ATA	512				
	Standard RAM		3				
	Standard ROM		28	28	60	124	252
Standard ROM Number of Writings			Max. 100,000 times				
Number of I/O Device Points			8192 points (X/Y0 to 1FFF) (*1)				
Number of I/O Points			4096 points (X/Y0 to FFF) (*2)				
Number of Device Points	Internal Relay [M]		Default 8192 points (M0 to 8191)				
	Latch Relay [L]		Default 8192 points (L0 to 8191)				
	Link Relay [B]		Default 8192 points (B0 to 1FFF)				
	Timer [T]		Default 2048 points (T0 to 2047) (used as low-speed or high-speed timer) Switching between low-speed and high-speed timers is set by instruction Low-speed/high-speed timer timing increments are parameter-set (Low-speed timer: 1 to 1000ms, 1ms increments, default 100ms) (High-speed timer: 0.1 to 100ms, 0.1ms increments, default 10ms)				
	Retentive Timer [ST]		Default 0 (ST0 to 2047) (used as low-speed or high-speed timer) Switching between low-speed and high-speed timers is set by instruction Low-speed/high-speed timer timing increments are parameter-set (Low-speed timer: 1 to 1000ms, 1ms increments, default 100ms) (High-speed timer: 0.1 to 100ms, 0.1ms increments, default 10ms)				
	Counter [C]		Normal counters Default 1024 points (C0 to 1023) Interrupt counters Max. 256 points. (Default 0 points, parameter setting)				
	Data Register [D]		Default 12288 points (D0 to 12287)				
	Link Register [W]		Default 8192 points (W0 to 1FFF)				
	Annunciator [F]		Default 2048 points (F0 to 2047)				
	Edge Relay [V]		Default 2048 points (V0 to 2047)				
	File Register [R]		When standard RAM is used: **Q02CPU:** 32768 points (R0 to 32767) **Q02HCPU, Q06HCPU:** The number of points of up to 65536 points can be used by block conversion in increments of 32768 points (R0 to 32767) **Q12HCPU, Q25HCPU:** The number of points of up to 131072 points can be used by block conversion in increments of 32768 points (R0 to 32767) • When a SRAM card (1 Mbyte) is used: The number of points of up to 517120 points can be used by block conversion increments of 32768 points (R0 to 32767) • When a SRAM card (2 Mbyte) is used: The number of points up to 1041408 points can be used by block conversion increments of 32768 points (R0 to 32767) • When a Flash card (2 Mbyte) is used: The number of points up to 1041408 points can be used by block conversion increments of 32768 points (R0 to 32767) • When a Flash card (4 Mbyte) is used: The number of points up to 1042432 points can be used by block conversion increments of 32768 points (R0 to 32767)				
	File Register [ZR]		When standard RAM is used: **Q02CPU:** 32768 points (ZR0 to 32767) **Q02HCPU, Q06HCPU:** 65536 points (ZR0 to 65535), No block conversion necessary **Q12HCPU, Q25HCPU:** 131072 points (ZR0 to 131071), No block conversion necessary • When a SRAM card (1 Mbyte) is used: 517120 points (ZR0 to 517119), No block conversion necessary • When a SRAM card (2 Mbyte) is used: 1041408 points (ZR0 to 1041407), No block conversion necessary • When a Flash card (2 Mbyte) is used: 1041408 points (ZR0 to 1041407), No block conversion necessary • When a Flash card (4 Mbyte) is used: 1042432 points (ZR0 to 1042431), No block conversion necessary				

MELSEC Q Series High Performance Sequence CPUs (continued)

Model Number		Q02CPU	Q02HCPU	Q06HCPU	Q12HCPU	Q25HCPU
Number of Device Points	Stocked Item	S	S	S	S	–
	Special Link Relay [SB]	[SB] 2048 points (SB0 to 7FF)				
	Special Link Register [SW]	[SW] 2048 points (SW0 to 7FF)				
	Step Relay [S]	8192 points (S0 to 8191)				
	Index Register [Z]	16 points (Z0 to 15)				
	Pointer [P]	4096 points (P0 to 4095), set in parameters the range in which the pointers/common pointers are used				
	Interrupt Pointer [I]	256 points (I0 to 255) In parameters, set the cyclic intervals of the system interrupt pointers I28 to I31 (0.5 to 1000ms, 0.5ms increments)				
	Special Relay [SM]	2048 points (SM0 to 2047)				
	Special Register [SD]	2048 points (SD0 to 2047)				
	Function Input [FX]	16 points (FX0 to F)				
	Function Output [FY]	16 points (FY0 to F)				
	Function Register [FD]	5 points (FD0 to 4)				
Link Direct Device		Device for direct access to link device. Specified format: J☐ ☐ \ ☐ ☐				
Intelligent Function Module Direct Device		Device for direct access to buffer memory of intelligent function module. Specified format: U☐ ☐ \ G ☐ ☐				
Latch (Power Failure Comp.) Range		L0 to 8191 (default) (Latch range setting can be made for B, F, V, T, ST, C, W and D)				
Remote RUN/PAUSE Contact		1 point can be set for each RUN and PAUSE contacts from X0-1FFF				
Clock Function		Year, month, day, hour, minute, second, day of week (Automatic leap year judgment) Accuracy –3.18 to +5.25 (TYP +2.12) s/d @ 0°C; Accuracy –3.93 to +5.25 (TYP +1.90) s/d @ 25°C Accuracy –14.69 to +3.53 (TYP –3.67) s/d @ 55°C				
Permissible Instantaneous Power Failure Time		Depends on power supply module				
5VDC Internal Current Consumption (A)		0.60	0.64	0.64	0.64	0.64
Weight (kg)		0.20	0.20	0.20	0.20	0.20
Dimensions (W x H x D) mm (in)		27.4 (1.08) x 98 (3.86) x 89.3 (3.52)				

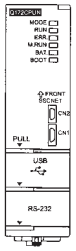
Notes:
1. Sum of the number of I/O points on the main/extension base directly controlled by the CPU module and the number of I/O points controlled as remote I/O by the remote I/O network.
2. Number of I/O points on the main/extension base directly controlled by the CPU module.

MELSEC Q Series Motion CPUs

Q Series motion CPUs offer the ability to integrate complex motion systems on a Q Series system alongside sequence, process & PC based functions. The motion CPUs allow costly, inflexible mechanical systems to be replaced by multiple axis motion control that is significantly easier and less expensive to design, build and re-configure.

Key Features:

- Up to 32 axes controlled by one CPU, allowing up to 96 axes per base rack
- Servo axes connect quickly and easily via daisy chain connection on SSCNET, eliminating complex, expensive wiring harnesses
- SSCNET offers high speed, deterministic control of each axis independently
- Allows integration with other automation technologies such as open language program control and Ethernet/Internet capabilities



Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
IB(NA)0300040	Q172CPU(N)/Q173CPU(N) User's Manual	Covers the Q172CPUN and Q173CPUN	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Q Motion CPUs

Model Number	Q173CPUN	Q172CPUN
Stocked Item	S	S
Number of Control Axes	32 axes	8 axes
Operation Cycle	Approx. 0.88ms	
Interpolation Function	Linear interpolation (Max.4-axes), Circular interpolation (2-axes), helical interpolation (3-axes) PTP (Point to Point), speed control, speed-position control, fixed-pitch feed, constant-speed control, position follow-up control, speed-switching control high speed oscillation control, synchronous control	
Acceleration/Deceleration Process	Automatic trapezoidal acceleration/deceleration, S-curve acceleration/deceleration	
Compensation Function	Backlash compensation, Electronic gear	
Program Language	Motion SFC, Dedicated instructions, Mechanical support language	
Program Capacity	14K steps	
Number of Positioning Points	3,200 points (Positioning data can be designated indirectly)	
Zeroing Function	Proximity DOG type, Count type, Data setting type	
JOG Operation Function	Available	
Sync. Encoder Operation Function	12 units can be connected	8 units can be connected
M-Function	M-code output function, M-code completion wait function	
Absolute Position System	Available by adding a battery to Servo Amplifier (Absolute or incremental system can be specified per axis)	
SSCNET I/F	5CH	2CH
Number of Modules Connected	Max. 64 modules (Number of Q-series Extension Base: Max. 7)	
Pulse Generator	Q172PX 4 modules can be used per CPU	Q172LX 1 module can be used per CPU
Synchronous Encoder	Q172EX 6 modules can be used per CPU	Q172EX 4 modules can be used per CPU
External Signal Input Module	Q173LX 4 modules can be used per CPU	Q173LX 3 modules can be used per CPU
Weight (kg)	0.23	0.22
Dimensions (W x H x D) mm (in)	27.4 (1.08) x 98 (3.86) x 114.3 (4.50)	27.4 (1.08) x 98 (3.86) x 114.3 (4.50)

Q Motion CPUs (continued)

Model Number				Q173CPUN • Q172CPUN
Certification				UL • cUL • CE
Program Capacity	Code Total (Motion SFC Chart + Operation Control + Transition)			287K bytes
	Text Total (Operation Control + Transition)			224K bytes
SFC Program	Number of Motion SFC Program			256 (No. 0 to 255)
	Motion SFC Chart Size / Program			Max. 64K bytes (included Motion SFC chart comments)
	Motion SFC Steps / Program			Max. 4094 steps
	Number of Selective Branch / Branch			255
	Number of Parallel Branch / Branch			255
	Nesting of Parallel Branch			Max. 4 levels
Operation Control Program (F/FS), Transition Program (G)	Number of Operation Control Programs			4096 with F (Once execution type) and FS (Scan execution type) combined (F/FS0 to F/FS4095)
	Number of Transition Programs			4096 (G0 to G4095)
	Code-Size / Program			Max. approx. 64k bytes (32766 steps)
	Number of Blocks (Lines) / Program			Max. 8192 blocks (in the case of 4 steps (min)/block)
	Number of Characters / Block (Line)			Max. 128 characters (comment included)
	Number of Operand / Block (Line)			Max. 64 (operand: constants, word devices, bit devices)
	Nesting of ( ) / Block			Max. 32 levels
	Descriptive Expression	Operation Control Program		Calculation expression/ bit conditional expression
		Transition Program		Calculation expression/ bit conditional expression/comparison conditional expression
Executed Specification	Number of Multi Executed Programs			Max. 256 programs
	Number of Multi Active Steps			Max. 256 steps/all programs
	Executed Task	Normal Task		Executed in motion main cycle
		Event Task (Available Mask)	Fixed Cycle	Fixed cycle (0.88ms, 1.77ms, 3.55ms, 7.11ms, 14.2ms)
			External Interrupt	Execute it when setted input is ON in 16 input point of QI60 external interrupt module
			PLC Interrupt	Execute with interrupt from PLC
		NMI Task		Execute it when setted input is ON in 16 input point of QI60 external interrupt module
Number of Input / Output (X/Y)				8192 points
Number of Actual Input / Output (PX/PY)				256 points
Device	Internal Relay (M)			Total 8192 points
	Latch Relay (L)			Total 8192 points
	Link Relay (B)			8192 points
	Annunciator (F)			2048 points
	Special Relay (M)			256 points
	Data Register (D)			8192 points
	Link Register (W)			8192 points
	Special Register (D)			256 points
	Motion Device (#)			8192 points
	Free Run Timer (FT)			1 point (888 micro second)

MELSEC Q Series Process Control CPUs

These CPUs include a wide variety of process control functions optimized to the task of controlling large scale, complex continuous processes where downtime is not an option. This allows a Q Series system to fully address the needs of users outside of the scope of traditional discrete control applications.

Key Features:

- 52 process control instructions added to standard instruction set
- Floating point math coprocessor dedicated to floating point and process control operations
- Autotuning PID with 2 degrees of freedom (responds to both set value and disturbance)
- Compensation functions to allow loop modeling closer to the actual process
- Process alarm functions related to high, low and deviation process and manipulated variable values
- Tracking functions to allow smooth transfer between manual and automated control
- Hot swappable modules
- Increased functionality in Version C or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function

Required Manuals

Model Number	Description	Contents	Included with CPU?	Stk Item
IB(NA)0800061	QCPU (Q mode) CPU Module User's Manual (Hardware)	General specs, CE compliance information, installation, safety requirements, power supply wiring, overview of system parts	No (included with base units)	–
SH(NA)080039	QCPU (Q Mode)/QnACPU Programming Manual	Covers all basic and applied instructions for both the Q and QnA CPU families, key resource for programming	No (purchase separately)	–
SH(NA)080041	QCPU (Q Mode)/QnACPU Programming Manual (SFC)	Covers sequential function chart, (SFC) programming, Programming Manual (SFC), A graphical, flowchart style alternative to ladder logic programming	No (purchase separately)	–
SH(NA)080040	QCPU (Q Mode)/QnACPU Programming Manual (PID Control Instructions)	Covers Proportional, Integral, Derivative (PID) programming for process control applications	No (purchase separately)	–
SH(NA)080483ENG	Q CPU (Hardware Design, Maintenance and Inspection) User's Manual	Overview, system configuration, general specifications, power supply units, base unit & extension cables, memory card & battery, EMC & low voltage directive, loading & installation, maintenance & inspection, troubleshooting	No (purchase separately)	–
SH(NA)080484ENG	Q CPU (Function Explanation, Program Fundamentals) User's Manual	Overview, system configuration, performance specification, sequence program configuration & execution conditions, assignment of I/O numbers, process CPU files, function, comms. with intelligent function modules, parameter list, devices, process CPU processing time, procedure for writing programs to process CPU, outline of multiple CPU systems, system configuration of MCS, allocating MCS I/O nos. comms. Between CPU modules in MCS, comms. between MCS I/O and IFM, processing time for MCS, starting up MCS	No (purchase separately)	–
SH(NA)080485ENG	QCPU User's Manual (Multiple CPU System)	Outline, system configuration, concept for multiple CPU system, communication between CPU modules, processing time of QCPU in multiple CPU system, parameter added for multiple CPU system, precautions for use of AnS Series module, starting up the multiple CPU system	No (purchase separately)	–
SH(NA)080316	QnPHCPU/QnPRHCPU (Process Control Instructions) Programming Manual	Overview, structure & combinations of process control, instructions, data used for process control instructions, how to execute PCI, execution condition switching & functions, instruction list, how to read instruction list, I/O control instructions, control operator instructions, compensation operator instructions, arithmetic operation instructions, comparison operation instructions, auto tuning, error codes, appendices	No (purchase separately)	–
SH(NA)080368	Programming Guide Book for Structured Text (ST)	Covers Structured Text programming method	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Process Control CPUs

Model Number		Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
Stocked Item		S	S	S	S
Control Method		Sequence program control method			
I/O Control Mode		Refresh mode. Direct access I/O is available by specifying direct access I/O (DX□, DY□)			
Programming Language	(Sequence Control Dedicated Language)	Relay symbol language, logic symbolic language, MELSAP3 (SFC), MELSAP-L, Function block and structured text (ST)			
	Process Control Language	FBD for process control (Programming by PX Developer)			
Processing Speed (Sequence Instruction)	LD X0	0.034 μs			
	MOV D0 D1	0.102 μs			
Total Number of Instructions		415 (excluding intelligent function module dedicated instructions)			
Constant Scan (ms) (Function for Setting the Scan Timer to Fixed Settings)		0.5 to 2000 (Configurable in increments of 0.5 ms). Set parameter values to specify			
Program Capacity (*1, *2)		28k steps (112 bytes)	60k step (240 bytes)	124k step (496 bytes)	252k step (1008 bytes)

Notes:

1. The unit of the file size stored in the memory area varies depending on the CPU module. For details, refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)
2. The maximum number of executable sequence steps is as shown. (Program capacity) – (File header size (default 34 steps)). Refer to the QCPU User's Manual (Function Explanation, Program Fundamentals)

Process Control CPUs (continued)

Model Number			Q02PHCPU	Q06PHCPU	Q12PHCPU	Q25PHCPU
Memory Capacity Item	Program Memory (Drive 0)		112k bytes	240k bytes	496k bytes	1008k bytes
	Memory Card (RAM) Drive 1		Capacity of the installed memory cards (2M byte max.)			
	Memory Card (ROM) Drive 2		Installed memory card capacity (Flash card: 4 Mbyte max., ATA card: 32 Mbyte max.)			
	Standard RAM Drive 3		128k bytes		256k bytes (*3)	
	Standard ROM Drive 4		112k byte	240k byte	496k byte	1008k byte
	CPU Shared Memory		8k bytes			
Maximum No. of Stored Files	Program Memory		28	60	124	252 (*4)
	Memory Card (RAM)		287 (when the Q2MEM-2MBS is used)			
	Memory Card (ROM)	Flash Card	288			
		ATA Card	512			
	Standard RAM		3 (*5)			
	Standard ROM		28	60	124	252
Standard ROM Number of Write Cycles			Max. 100,000 times			
Number of I/O Device Points			8192 points (X/Y0 to 1 FFF) (Number of devices usable in program)			
Number of Occupied I/O Points			4096 points (X/Y0 to FFF) Number of points accessible to actual I/O modules			
Number of Device Points (*6)	Internal Relay [M]		Default 8192 points (M0 to 8191) changeable			
	Latch Relay [L]		Default 8192 points (L0 to 8191) changeable			
	Link Relay		Default 8192 points (B0 to 1FFF) changeable			
	Timer [T]		Default 2048 points (T0 to 2047) (for low/high speed timer) Select between low / high speed timer by instructions The measurement unit of the low / high speed timer is set with parameters. Low speed timer: 1 to 1000ms, 1 ms/unit, default 100ms High speed timer: 0.1 to 100ms, 0.1ms/unit, default 10ms			
	Retentive Timer [ST]		Default 0 points for low/high speed retentive timer. Switchover between the low/high speed retentive timer is set by instructions. The measurement unit of the low/high speed retentive timer is set with parameters Low speed retentive timer: 1 to 1000ms, 1 ms/unit, default 100ms High speed retentive timer: 0.1 to 100ms, 0.1ms/unit, default 10ms			
	Counter [C]		Normal counter default 1024 points (C0 to 1023) changeable Interrupt counter maximum 256 points (default 0 point, set with parameters)			
	Data Register [D]		Default 12288 points (D0 to 12287) changeable			
	Link Register [W]		Default 8192 points (W0 to 1FFF) changeable			
	Annunciator [F]		Default 2048 points (F0 to 2047) changeable			
	Edge Relay [V]		Default 2048 points (V0 to 2047) changeable			
	File Register (*7)	Standard RAM [R]	Up to 65536 points can be used by block switching units in units of 32768 points (R0 to 32767)		Up to 131072 points can be used by block switching in units of 32768 points (R0 to 32767)	
		SRAM Card (1MB) [R]	Up to 517120 points can be used by block switching in units of 32768 points (R0 to 32767)			
		SRAM Card (2MB) [R]	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)			
		Flash Card (2MB) [R]	Up to 1041408 points can be used by block switching in units of 32768 points (R0 to 32767)			
		Flash Card (4MB) [R]	Up to 1042432 points can be used by block switching in units of 32768 points (R0 to 32767)			
		Standard RAM [ZR]	65536 points (ZR0 to 65535),block switching not required		131072 points (ZR0 to131071),block switching not required	
		SRAM Card (1MB) [ZR]	517120 points (ZR0 to 517119),block switching not required			
		SRAM Card (2MB) [ZR]	1041408 (ZR0 to1041407,block switching not required			
		Flash Card (2MB) [ZR]	1041408 points (ZR0 to 1041407),block switching not required			
		Flash Card (4MB) [ZR]	1042432 points (ZR0 to1042431),block switching not required			
	Special Link Relay [SB]		2048 points (SB0 to 7FF) The number of device points is fixed			
	Special Link Register [SW]		2048 points (SW0 to 7FF) The number of device points is fixed			
	Step Relay [S] (*8)		8192 points (S0 to 8191) The number of device points is fixed			
	Index Register [Z]		16 points (Z0 to 15) The number of device points is fixed			
	Pointer [P]		4096 points (P0 to 4095) The number of device points is fixed. The use ranges of the local pointers and common pointers can be set up by parameters			
	Interrupt Pointer [I]		256 points (I0 to 255) The number of device points is fixed. The constant cyclic interval of the system interrupt pointers I28 to I31 can be set with parameters. (0.5 to 1000ms, 0.5ms/unit) Default I28: 100ms; I29: 40ms; I30: 20ms; I31: 10ms			
	Special Relay [SM]		2048 points (SM0 to 2047) The number of device points is fixed.			
	Special Register [SD]		2048 points (SD0 to 2047) The number of device points is fixed.			
	Function Input [FX]		16 points (FX0 to F) The number of device points is fixed.			
	Function Output [FY]		16 points (FY0 to F) The number of device points is fixed.			
	Function Register [FD]		5 points (FD0 to 4) The number of device points is fixed.			
Link Direct Device			Device having a direct access to link device. CC-Link IE controller network and MELSECNET/10(H) use only Specified form: J□ □\X□ □, J□ □ \Y□ □, J□ □ \W□ □, J□ □ \B□ □, J□ □ \SW□ □, J□ □ \SB□ □			
Intelligent Function Module Device			Device having a direct access to the buffer memory of the intelligent function module, Specified form U□ □\G□ □			
Latch (Power Failure Compensation) Range			L0 to 8191 (default) (Latch range can be set for B, F, V, T, ST, C, D, and W) Setting by parameters			
Remote RUN/PAUSE Contact			RUN and PAUSE contacts can be set from among X0 to 1FFF, respectively. Setting by parameters			
Clock Function			Year, month, day, hour, minute, second, day of the week (leap year automatic distinction) Accuracy -3.18 to +5.25s (TYP. +2.12s)/d at 0°C; Accuracy -3.93 to +5.25s (TYP. +1.90s)/d at 25°C; Accuracy -14.69 to +3.53s (TYP. -3.67s)/d at 55°C			
Allowable Momentary Power Failure Period			Varies according to the type of power supply module			
5VDC Internal Current Consumption			0.64A			
Weight			0.20 kg			
Dimensions (W x H x D) mm (in)			98 (3.86) x 27.4 (1.08) x 89.3 (3.52)			

Notes:

3. CPU shared memory is not latched.
4. The CPU module can only execute up to 124 programs.
5. Extended by the upgraded functions of the CPU module.
6. The number of points can be changed within the setting range.
7. Read only when Flash card is used. ATA card is not useable.
8. The step relay is the device for the SFC function.

MELSEC Q Series Redundant CPUs

These CPUs take the process control capabilities of the Q Series process CPUs and add full hot-backup capability by using dual redundant CPUs. Use this system in applications where downtime cannot be tolerated for reasons of safety, equipment damage, financial loss, interruption of service, or regulatory compliance.

Key Features:

- Prevent controller downtime with dual redundant CPUs (control and back-up). Any failure of the control CPU causes immediate transfer of control to the back-up, preventing system failure or interruption.
- Synchronize up to 100,000 words of process data between CPUs per scan
- Switchover time typically around 40ms, insuring "bumpless" transfer
- CPUs reside on physically separate racks, allowing control CPU to be replaced while back-up maintains system operation
- Low cost of ownership; most parts are interchangeable with standard Q Series systems
- Redundant power supply option
- Redundant MELSECNET/H control level network provides link to I/O stations at up to 25Mbit/s
- Over 50 process control related instructions (same as Q Process CPUs)
- Most I/O may be hot swapped
- Increased functionality in Version D or later (S/N 07032x)
  - SFC active step comment readout instruction
  - Increased multiple CPU shared memory flexibility
  - 1/1000 second resolution timestamp capability
  - Store sampling trace data in Standard RAM
  - Power supply error detection function

Required Manuals

Use same manual set as shown for Q Series Process CPUs, plus the manual listed below.

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080486ENG	QnPRHCPU User's Manual (Redundant System)	Overview • System Configuration • Tracking cable Procedure for starting up a redundant system • Redundant system functions • Redundant system networks • Programming cautions • Troubleshooting Processing time for redundant systems	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Specifications

Model Number		Q12PRHCPU	Q25PRHCPU
Stocked Item		S	S
Control System		Cyclic program scan	
I/O Control		Refresh mode	
Programming Language	Sequence Control Dedicated Lang.	Ladder, list, ST, SFC	
	Process Control Language	FBD for process control (*1)	
Number Of I/O Device Points (*2)		8192 points	
Number Of I/O Points (*3)		4096 points	
Number Of CPUs Mounted		1 (multiple-CPU configuration is not available)	
Number Of Mountable Modules		11 on the main base unit (7 when the power supply is redundant type)	
Number Of Extension Base		0 (All non-redundant modules are mounted on the remote I/O station (the maximum number of modules that can be mounted on a remote station is 64).)	
Number Of Remote I/O Points		8192 points (up to 2048 points per station)	
Program Capacity	Number of Steps	124 ksteps	252 ksteps
	Number of Programs	124	252 (*4)
Device Memory Capacity (*5)		Device memory: 29 kwords File register (internal): 128 kwords (Extended up to 1017 kwords by adding a memory card (2 MB))	
Instruction Types		Sequence basic/applied instructions, instrumentation instructions Instrumentation instruction types: Control/Operation instructions, I/O control instructions, compensation operation instructions, arithmetic operation instructions, comparison operation instructions, automatic tuning instructions	
Functions Compatible With Redundant System		Redundant configuration of the entire system, including the CPU, the power supply, and the base unit Hot standby system for the control and standby systems online module change both backup and separate mode available. Large-capacity data tracking: Large-capacity device data transfer (100 kwords) from the control system to the standby system Network system compatible with redundant system: Switchover in case of MELSECNET/H or Ethernet module malfunction or network wire disconnection Engineering environment (GX Developer) Communication with programming tools: The control system or standby system can be designated by direct connection to the CPU or connection via a network. Online program change function: PLC write, online program change, online multi-block change Program memory copy function Copying control system: programs to the standby system Redundant system setting: The tracking device and network paring can be set with parameters.	
Loop Control Specs.	Control Cycle	10 ms -/control loop (Can be set for each loop.)	
	Number of Control Loops	No limit (*6)	
	Main Functions	2-degree-of-freedom PID control, cascade control, automatic tuning function, feed forward control	
RAS	Online Module Replacement	The I/O, analog, temperature input, temperature control, and pulse input modules can be replaced (on a remote I/O station).	
	Output In Case Of Error Stop	Clear or output retention can be designated for each module.	
Communication Port		USB, RS-232	
Modules That Can Be Mounted On Main Base Unit		Network modules for the Q series can be mounted (Ethernet, MELSECNET/H, and CC-Link only)	
Programming Software		GX Developer, PX Developer	

Notes:

1. PX Developer is required for programming by FBD.
2. Total number of the I/O points on the main base unit, which are directly controlled from the CPU module, and the I/O points controlled as remote I/O by the remote I/O network.
3. The number of I/O points on the main base unit, which are directly controlled from the CPU module.
4. The max. number of files that can be executed is 124. Two SFC/MELSAP-Ls are available, one of which is a program execution control SFC.
5. Each number of device points in the data memory can be changed within 29 kwords, depending on the parameters.
6. The number of control loops is restricted by the combination of the device memory capacity (128 kwords/loop used) and the control cycle.

Q Redundant CPU Parts

Product Name	Model	Overview	Stk Item
Redundant CPU Module	Q12PRHCPU	Number of I/O points: 8192 (actual number of I/O points: 4096), program capacity: 124 ksteps	–
	Q25PRHCPU	Number of I/O points: 8192 (actual number of I/O points: 4096), program capacity: 252 ksteps	S
Tracking Cable	QC10TR	1m cable for tracking	S
	QC30TR	3m cable for tracking	–
Base Unit For Redundant Power Supply Systems	Q38RB-E	Q series I/O mounting main base: Number of power supply slots: 2, number of CPU slots: 1, number of I/O slots: 8	–
	Q68RB	Q series I/O mounting extension base: Number of power supply slots: 2, number of I/O slots: 8	S
Power Supply Module For Redundant Power Supply Systems	Q64RP	100 to 120/200 to 240 V AC input, 5 VDC, 8.5 A output	–

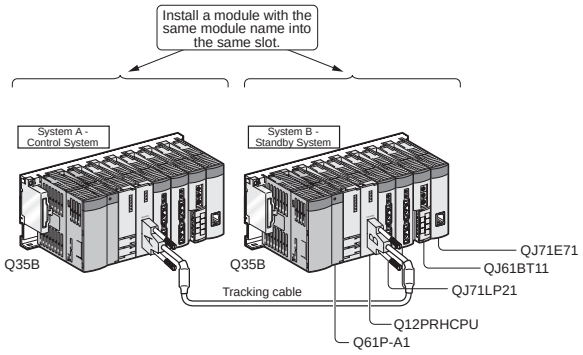
Communication and Networking Module Version Information For Compatibility With Redundant Systems

Product Name	Model	Overview	Version	Stk Item
MELSECNET/H Master Module	QJ71LP21-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) control / normal / master stations	Function version "D" or later	S
	QJ71LP21S-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) control / normal / master stations, equipped with an external power supply		–
	QJ71LP21GE	For MELSECNET/H dual optical loop interface module (compatible with GI) control / normal / master stations		–
	QJ71BR11	For MELSECNET/H coaxial single bus interface module control / normal / master stations		S
MELSECNET/H Remote I/O Module	QJ72LP25-25	For MELSECNET/H dual optical loop interface module (compatible with SI and QSI) remote I/O stations (*1)		S
	QJ72LP25GE	For MELSECNET/H dual optical loop interface module (compatible with GI) remote I/O stations		–
	QJ72BR15	For MELSECNET/H coaxial single bus interface module remote I/O stations		S
Ethernet Interface Module	QJ71E71-B2	Ethernet interface module (10BASE2)		–
	QJ71E71-B5	Ethernet interface module (10BASE5)		–
	QJ71E71-100	Ethernet interface module (100BASE-TX/10BASE-T)		S
MELSECNET / H Board For Personal Computers	Q80BD-J71LP21-25	For dual optical loop interface board (compatible with SI and QSI) control / normal stations (*1)		S
	Q80BD-J71LP21G	For dual optical loop interface board (compatible with GI) control / normal stations (*1)		–
	Q80BD-J71BR11	For coaxial single bus interface board control / normal stations (*1)		S

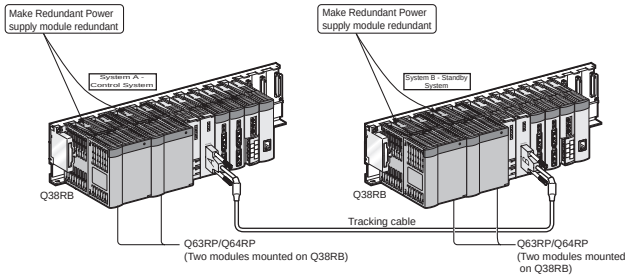
Note:
1. The boards must be used in combination with the attached driver package SW0DNC-MNETH-B[90K] or later version.

Sample Configurations

Non-redundant power supply configuration



Redundant power supply configuration



Q PC CPU

The Q Series is unique in the way it offers the ability to integrate true open control capabilities with conventional automation technologies by way of a PC CPU. This CPU fits directly onto the Q Series base rack and offers complete PC capabilities. The PC CPU may be used either on its own, or combined with other CPU types as required.

Key Features:

- Available with a choice of hardware configurations
- Run conventional Microsoft® Windows® applications, as with any other PC
- Combine control of automation via sequence or motion CPUs with third party software applications
- Full integration with Q Series I/O, special function and networking/ communication modules
- Offers virtually unlimited application flexibility. Some examples include:
  - Create custom control systems using third party programming languages such as Microsoft® Visual Basic®, C++, or other established languages
  - Adding multimedia capabilities to systems for operator diagnostics
  - Adding common business applications for data manipulation and logging to aid quality assurance
- PC CPU must be ordered as a package. Please refer to the "Q PC CPU Ordering Information" for model numbers.

Specifications

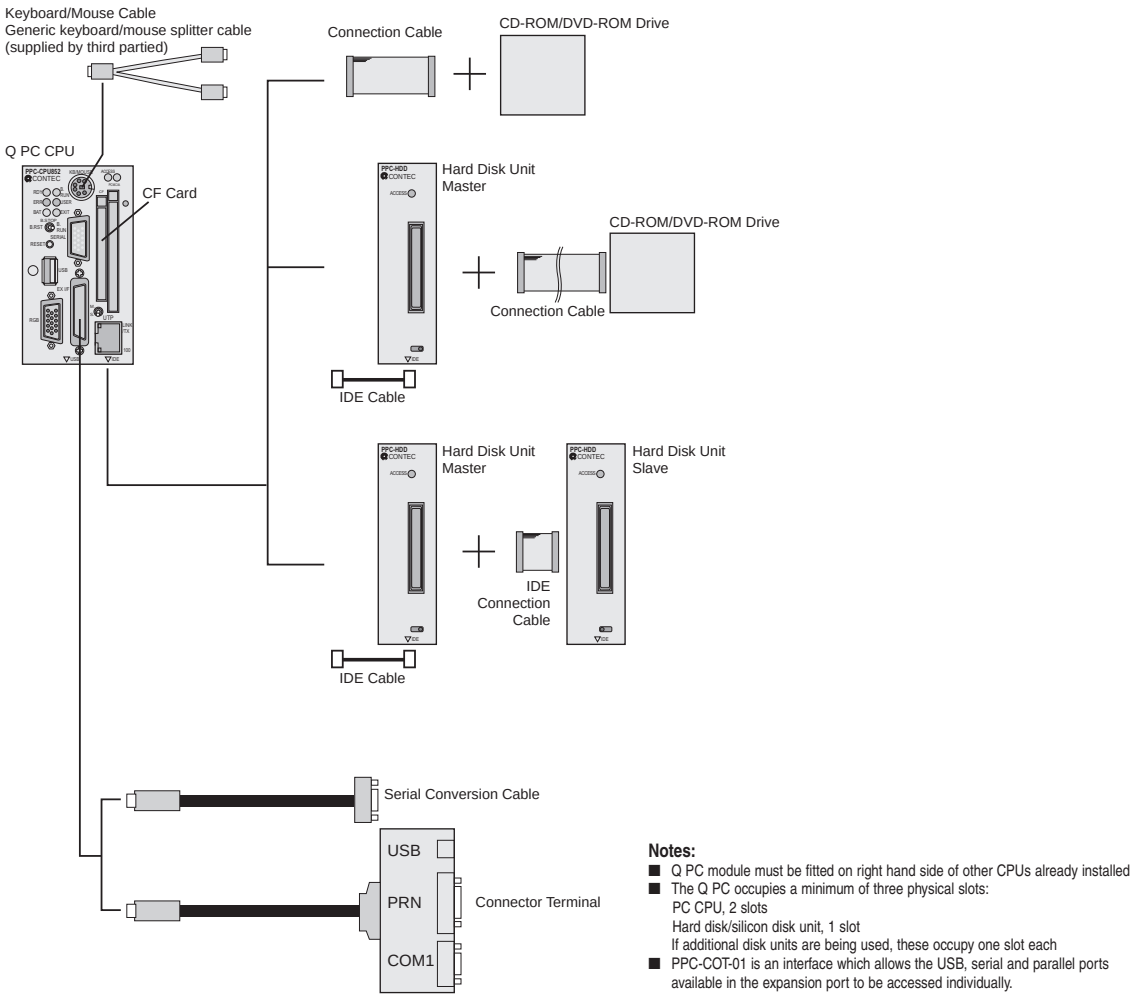
Model Number		PPC-852
Stocked Item		S
CPU		Ultra Low Voltage Intel® Celeron® M Processor 600MHz (FSB400MHz)
Chipset		Intel® 852GM
Memory	L1 Cache	32KB x 2
	L2 Cache	512KB
	Main Memory	512KB (3.3V 200pin DDR SO-DIMM DDR266 Socket x 1)
Video	Controller	Built-in 852GM
	Video RAM	Main memory shared (Max. 64MB)
	CRT I/F	Analog RGB 15-pin HD-SUB connector
	Specifications	(see table below)
IDE I/F	Primary	40-pin half-pitch connector (Max. 2 units acceptable) (*1)
	Secondary	Not supported
Serial Interface		RS-232C compliant: 2 channels (9-pin D-SUB connector and extension interface (EX.I/F)) Transfer rate: 50-115,200 bps
Parallel Interface		1 channel (Extension interface (EX.I/F)) Supported modes: Normal, SPP, EPP, 1.7/1.9, ECP
LAN	I/F	Ethernet 100BASE-TX/10BASE-T RJ-45 connector
	Controller	82551QM (Intel)
PC Cards	Controller	R5C485 (RICOH)
	Card Type	Supporting PCMCIA, CardBus
	Card Slot	Type I, II x 1
	Display (*2)	Card detection LED (green)
CF Card Slot (*3)		CF CARD Type I, II x 1 (dedicated to memory card) (primary IDE) (*1) CF card master/slave switching SW
USB I/F		USB2.0 compliant 3ch (Front: 1ch, Bottom: 2ch) Transfer rate: 480Mbps USB1.1 compliant 1ch (extension interface (EX.I/F)) Transfer rate: 1.5M/12Mbps
Keyboard / PS2 Mouse Interface		6-pin mini-DIN connector (Shared by keyboard and mouse) Both can be used at the same time with the conversion cable KB-PSY02K3 (SANWA SUPPLY)
Watchdog Timers		2ch. Time-out period: System WDT 20 msec - 2 sec, User WDT 10msec - 10 sec
RTC / CMOS		Lithium-ion battery backup. Battery life: 10 years min. (at 25°C). Real Time Clock precision: (±3 min/month(at 25°C)
Display LEDs		RDY (Green), B.RUN (Green), ERR. (Red), USER (Red), BAT. (Orange), EXIT (Green), ACCESS (Green)
Controls		Reset push-button, 6-bit DIP switch, 3-position toggle switch
Supported OS		Windows XP Professional, Windows XP Embedded, Windows 2000 Professional
Base Unit Slots Occupied		2 slots
External Dimensions mm (inch)		55.2 (2.2) x 98.0 (3.9) x 115.0 (4.5) (Excluding protrusions)
Power Consumption		+5VDC 3.0A (Max.) (*4)
Acceptable Momentary Power Failure Time		Depends on the power supply module
Weight kg (lbs)		0.44 (0.97)

	VGA (640 x 480)	SVGA (800 x 600)	XGA (1024 x 768)	SXGA (1280 x 1024)
Horizontal Sync Signal Frequency	31.5KHz	37.9KHz	48.4KHz	64.1KHz
Vertical Sync Signal Frequency	60Hz	60Hz	60Hz	60Hz
Display Colors	16,777,215	16,777,215	16,777,215	16,777,215

Notes:

1. The IDE device (HDD, CF card, and CD-ROM/DVD-ROM) that can be connected at the same time is up to two additionally. Please refer to the system configuration for more details.
2. Comes on when the CF card is recognized normally and remains on until unplugging the card is detected.
3. Please use the CONTEC's CF (FIX DISK specifications) when you start Windows from the CF card. (However, select a CF card with a capacity sufficient to install Windows successfully).
4. This does not include the current consumption by any peripheral device (such as the PC Card, USB device, keyboard, or mouse) or by the connector terminal.
5. All trademarks are the property of their owners and acknowledged.

Q PC System Configuration



Notes:
- Q PC module must be fitted on right hand side of other CPUs already installed
- The Q PC occupies a minimum of three physical slots:
  PC CPU, 2 slots
  Hard disk/silicon disk unit, 1 slot
  If additional disk units are being used, these occupy one slot each
- PPC-COT-01 is an interface which allows the USB, serial and parallel ports available in the expansion port to be accessed individually.

Q PC CPU Ordering Information

Model Number	Stocked Item	Configuration			
		PC CPU Unit	Storage Unit + OS	Bus Interface Driver	Recovery CD
PPC-852-21B	–	PPC-852	PPC-HDD(MS)A	PPC-DRV-01	Windows 2000 Professional
PPC-852-21G	S		PPC-HDD(MS)A	PPC-DRV-01	Windows XP Professional
PPC-852-22F	S		CF-1GB-R	PPC-DRV-01	Windows XP Embedded

Notes:
- PC CPU Unit is sold with above configuration (in setting) only, and not available individually
- OS is preinstalled (Recovery CD also provided)
- Bus Interface Driver is provided with CD-ROM (not preinstalled)

Optional Products

Model Number	Stocked Item	Description
PPC-HDD(MS)	–	Hard Disk Unit (20GB)
CF-1GB-R	–	CF Card, 1GB (Fixed Disk specification)
IPC-CDD-02	S	CD-ROM/DVD-ROM Drive (bundle with cable, 40cm) (*1)
PPC-CDC-01	S	Connection Cable for above (*2)
PPC-COT-01	S	Connector Terminal (bundle with cable, 1m)
PPC-SCC-01	–	Serial Conversion Cable, 36-pin half-pitch to 9-pin D-SUB, 50cm in cable length
PPC-HBR-01	S	Hard Disk Unit shock-proof fixing bracket
PPC-DINAD-01	S	Adapter to install PPC-COT-01on DIN rail
PPC-CPU852(MS)-MU	–	English version of the User's Manual Set (PC CPU Unit + Bus Interface Driver)

Notes:
1. Bundle cable cannot be used when connecting with PC CPU to install OS on CF card.
2. Connection with IPC-CDD-02 is required when OS is installed on CF card in PC CPU.

Ⓑ MELSEC Q Series Base Units

The base unit (sometimes called a base rack) is the foundation of Q Series systems. All CPU modules are installed on it, along with a power supply, I/O and special function modules. Besides providing physical support to the component modules, the base unit enables communication and power distribution between modules. The base unit can either be directly bolted to a panel, or mounted via DIN rail. In the case of DIN rail mounting, the DIN rail Adapters must be used. Base units accommodate between 3 & 12 modules. For systems that require more modules than be accommodated on the base unit, an extension base unit is required. These connect to the base unit via extension cables.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800061	QCPU(Q mode) CPU Module User's Manual (Hardware)	• General specs • CE compliance information • Installation • Safety requirements • Power supply wiring • Overview of system parts	No (included with base units)	–
SH(NA)080483ENG	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• PSU specs • CPU H/W specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Base Units

Model Number	Q33B-E	Q35B-E	Q38B-E	Q38RB-E	Q312B-E
Stocked Item	S	S	S	–	S
Certification	UL • cUL • CE				
Number of Slots	3	5	8	8	12
Applicable I/O and Intelligent Function Modules	Q Series/iQ Modules				
Mounting Hole Size	5mm keyhole (for M4 screw)				
Dimension (W x H) mm (in)	189 (7.45) x 98 (3.86)	245 (9.65) x 98 (3.86)	328 (12.92) x 98 (3.86)	439 (17.30) x 98 (3.86)	
Weight (kg)	0.21	0.27	0.36	0.47	0.47
Accessories	4- M4 x 14 base unit mounting screws				

MELSEC Q Series / iQ DIN Rail Adapters

Use these Adapters in situations where mounting of a base or extension unit on a DIN rail is required.
Note: DIN rail mounting is not recommended in locations where high vibration or mechanical shock exists.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080483ENG	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• CPU H/W specs • PSU specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	–

DIN Rail Mounting Adapters

Type	Applicable Base or Extension Base	Stocked Item
Q6DIN1	Q38B, Q312B, Q68B, Q612B	S
Q6DIN2	Q35B, Q65B, Q00JCPU	S
Q6DIN3	Q33B, Q52B, Q55B, Q63B	–

Melsec Q Series / iQ Power Supply Modules

Power supply modules always fit on the left hand end of a rack. All base racks (Q3xB-E) must include a power supply, as do powered extension racks (Q6xB). We offer PSU to address worldwide AC voltage standards and DC power.

Model Number		Q61P-A1	Q61P-A2	Q62P	Q63P	Q64P	Q63RP	Q64RP
Stocked Item		S	S	S	S	S	–	–
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	—	—
Applicable Base Unit		Q3□B, Q6□B					Q3□RB, Q6□RB	
Input Power Supply*		100-120 VAC +10%/-15%	200-240 VAC +10%/-15%	100-240 VAC +10%/-15%	24 VDC +10%/-15%	100 to 120 VAC/ 200 to 240 VAC (+10%/ -15%) (85 to 132 VAC/170 to 264 VAC	24 VDC +30%/-35% (15.6 to 31.2VDC)	100 to 120 VAC/ 200 to 240 VAC (+10%/ -15%) (85 to 132 VAC/170 to 264 VAC
Input Frequency		50/60Hz ±3Hz			—	50/60 Hz ±5%	50/60 Hz ±5%	50/60 Hz ±5%
Input Voltage Distortion Factor		5% or less			—	Within 5%	Within 5%	Within 5%
Max. Input Apparent Power		105VA			—	160 VA	65W	160VA
Inrush Current		20A within 8ms			100A within 1ms	20A within 8 ms	150A within 1ms	20A within 8ms
Rated Output Current	5VDC	6A		3A	6A	8.5A	8.5A	8.5A
	24VDC	—	—	0.6A	—	—	—	—
External Output Voltage		—	—	24 VDC±10%	—	—	—	—
Overcurrent Protection	5VDC	6.6A or more		3.3A	6.6A	9.9 to 14.4A	9.35A or more	9.35A or more
	24VDC	—	—	0.66A	—	—	—	—
Overvoltage Protection		5.5 to 6.5 VDC						
Efficiency		70% or more		65% or more	70% or more	70% or more	65% or more	65% or more
Permissible Instantaneous Power Failure Time		Within 20ms		Within 20ms	Within 10ms	Within 20ms	Within 10ms	Within 20ms
Dielectric Withstand Voltage		Across inputs/LG-outputs/FG 2,830 VAC rms/3 cycles (altitude 2000m (6562 ft.))			500VAC across primary and 5VDC	Across inputs/LG and outputs/FG 2,830 VAC rms/ 3 cycles (2000 m (6562 ft)	500VAC across primary and 5VDC	Across inputs/LG and outputs/FG 2,830 VAC rms/ 3 cycles (2000 m (6562 ft)
Insulation Resistance		Inputs-outputs (LG/FG separated), inputs-LG/FG, outputs-LG/FG 10MΩ or more by 500 VDC insulation resistance tester			10MΩ or more by 500 VDC insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by insulation resistance tester.	10MΩ or more by insulation resistance tester	Across inputs and outputs (LG and FG separated), across inputs and LG/FG, across outputs and FG/LG 10MΩ or more by insulation resistance tester.
Noise Immunity		By noise simulator of 1,500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise frequency			By noise simulator of 500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise	By noise simulator of 1,500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise frequency. Noise voltage IEC61000-4-4, 2kV	By noise simulator of 500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise frequency	By noise simulator of 1,500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise frequency. Noise voltage IEC61000-4-4, 2kV
Operation Indication		LED indication (lit at 5 VDC output)					LED indication (Normal operation: ON (green) Error: OFF (red))	
Fuse		Built-in (unchangeable by user)						
Contact Output Section	Application	ERR contact (Contact turned off (opened: b contact) at CPU error stop)					ERR contact	
	Rated Switching Voltage/Current	24VDC, 0.5A						
	Minimum Switching Load	5VDC, 1mA						
	Response Time	OFF-ON: 10ms or less ON-OFF: 12ms or less						
	Life	Mechanical: 20 million times or more • Electrical: Rated switching voltage/current, 100 thousand times or more						
	Surge Suppressor	No						
	Fuse	No						
Terminal Screw Size		M3.5 x 7						
Applicable Wire Size		0.75 to 2mm^2					0.75 to 2mm^2	
Applicable Crimping Terminal		RAV1.25-3.5, RAV2-3.5					R1.25-3.5, R2-3.5 • RAV1.25-3.5, RAV2-3.5	
Applicable Tightening Torque		0.66 to 0.89N•m					0.66 to 0.89N•m	
Weight (kg)		0.31		0.39	0.33	0.40	0.60	0.47
Dimensions (W x H x D) mm (in)		55.2 (2.17) x 98 (3.86) x 90 (3.55)				55.2 (2.17) x 98 (3.86) x 115 (4.53)	83 (3.27) x 98 (3.86) x 115 (4.53)	

Note: Q64P automatically switches the input voltage (100 VAC or 200 VAC). It does not support intermediate voltages in the range 133 to 169 VAC. The CPU module may not work normally if a voltage in this range is supplied to Q64P.

Ⓓ MELSEC Q Series / iQ Extension Base Units and Connection Cables

Use extension base units (also known as extension racks) in systems that require more modules than can be accommodated on the base unit. Extension base units are available with a slot for an additional power supply (Q6xB) or without (Q5xB). Use Q6xB extension bases in systems where the current supplied by the base unit power supply is insufficient for the whole system. Up to 7 extension base units may be connected to the base unit, allowing a total of 8 bases. The 8 base units may be extended over a distance of up to 13.2 m (43.28 ft). The maximum number of installed modules is 64. If your system requires more modules or greater distances, consider using a network to link the system together. See the network section for more details.

Required Manuals

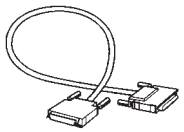
Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800061	QCPU (Q mode) CPU Module User's Manual (Hardware)	• General specs • CE compliance information • Installation • Safety requirements • Power supply wiring • Overview of system parts	No (included with base units)	–
SH(NA)080483ENG	QCPU (Q Mode) User's Manual (Hardware Design, Maintenance & Inspection)	• CPU H/W • PSU specs • Base Unit specs • Memory Card specs • CE compliance information • Installation • Maintenance & inspection • Troubleshooting	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Extension Base Units

Model Number	Q52B	Q55B	Q63B	Q65B	Q68B	Q68RB	Q612B	Q65WRB
Stocked Item	–	S	–	S	S	S	S	S
Certification	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Number of I/O Modules Mounted	2	5	3	5	8	8	12	5
Power Supply Module Slot	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Applicable I/O Modules	I/O Modules for Q Series							
Mounting Hole Size	5 mm keyhole (for M4 screw)							
Dimensions (W x H) mm (in)	106 (4.18) x 98 (3.86)	189 (7.45) x 98 (3.86)	189 (7.45) x 98 (3.86)	245 (9.65) x 98 (3.86)	328 (12.92) x 98 (3.86)	439 (17.30) x 98 (3.86)	439 (17.30) x 98 (3.86)	439 (17.30) x 98 (3.86)
Weight (kg)	0.14	0.23	0.23	0.28	0.38	0.49	0.48	0.52
Accessories	4 - M4 x 14 base unit mounting screws					5 - M4 x 14 mounting screws	4 - M4 x 14 mounting screws	5 - M4 x 14 mounting screws

MELSEC Q Series / iQ Extension Cables for Extension Base Units



These cables are used to link base units to extension base units. They are available in a variety of lengths from 0.45m (1.48 ft.) to 10m (32.8 ft.).

Model Number	QC05B	QC06B	QC12B	QC30B	QC50B	QC100B
Stocked Item	S	S	S	S	S	S
Certifications	CE	CE	CE	CE	CE	CE
Cable Length (m (ft))	0.45 (1.48)	0.6 (1.97)	1.2 (3.93)	3 (9.84)	5 (16.39)	10 (32.79)
Compatible Base Units	Main base unit (Q33B, Q35B, Q38B, Q312B) Extension base unit (Q63B, Q65B, Q68B, Q612B, Q52B, Q55B)					
Resistance Value Ω	0.044	0.051	0.082	0.172	0.273	0.530
Weight (kg)	0.15	0.16	0.22	0.40	0.60	1.11

Required Manuals: Same as Base Units listed above.

MELSEC Q Series Tracking Cable for QnPRH System

These cables are used to link redundant QnPRH CPU systems to insure data and programs are always synchronized between the two processors.

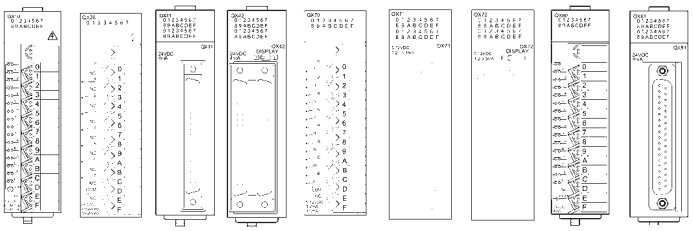
Model Number	QC10TR	QC30TR
Stocked Item	S	–
Cable Length m (ft)	1.0 (3.29)	3.0 (9.87)
Weight (kg)	0.15	0.28
Tightening Torque	0.29N•m	0.29N•m

Required Manuals: Same as Base Units listed above.

MELSEC Q Series / iQ RS232 Communication Cable

Model Number	SC-Q
Stocked Item	S
Cable Length m (ft)	3 (9.84)
Connection Type	RS232 Connection: 9 pin DSUB to Q Series front port connection

E MELSEC Q Series / iQ Digital Input Modules



Digital input modules provide the CPU interface for monitoring on/off voltage signals in your system.

Key Features:

- Sense commonly used AC and DC voltages
- Negative/positive common types
- 16, 32 or 64 inputs per module, depending on module type.
- 1-70ms software selectable input filter response time (via GX Developer) for adjusting input response. This avoids the effects of noise on the inputs
- DC input short circuit protection
- Internal optoisolation
- Removable terminal blocks
- Established A Series connectors (FCN/D-sub type) on 32 & 64 I/O modules for compatibility with existing A Series terminal block (A6TBXY type) installations

If you need to monitor varying signal levels of voltage or current, please refer to the analog input modules section. If you need to monitor digital signals that change their state rapidly (more than approximately 10 Hz, depending on program scan time), then consider using high-speed counter modules.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User's Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Q Series / iQ Input Modules

Model Number		QX10	QX28	QX40	QX40-S1
Stocked Item		S	–	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Input Type		AC	AC	DC positive common (sink)	DC positive common (sink)
No. of Input Points		16	8	16	16
Input Voltage		100-120 VAC +10%/-15%, 50/60Hz ±3Hz	100-240 VAC +10%/-15%, 50/60Hz ±3Hz	24 VDC +20%/-15%	24 VDC +20%/-15%
Input Current (mA)		8	17 (@200 VAC/60Hz)/ 14(@200 80@100 VAC/60Hz)/ VAC/50Hz) 7(100 VAC/50Hz)	4	6
Response Time (ms)	OFF–ON	15@100 VAC, 50/60Hz	10@100 VAC, 50/60Hz	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
	ON–OFF	20@100 VAC, 50/60Hz	20@100 VAC, 50/60Hz	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
Minimum On Voltage/Current		80VAC/5mA (50/60Hz)	80VAC/5mA (50/60Hz)	19 VDC/3mA	19 VDC/4mA
Maximum Off Voltage/Current		30VAC/1.7mA (50/60Hz)	30VAC/1.7mA (50/60Hz)	11 VDC/1.7mA	11 VDC/1.7mA
Connection Type		Screw Terminals	Screw Terminals	Screw Terminals	Screw Terminals
Points/Common		16	8	16	16
Maximum 5VDC Current Consumption (mA)		50	50	50	60
Weight (kg)		0.17	0.2	0.16	0.2
Dimensions (W x H x D) mm (in)		27.4 (1.1) x 98 (3.9) x 90 (3.5)			

Model Number		QX41	QX41-S1	QX42	QX42-S1
Stocked Item		S	–	S	–
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Input Type		DC positive common (sink)	DC positive common (sink)	DC positive common (sink)	DC positive common (sink)
No. of Input Points		32	32	64	64
Input Voltage		24 VDC +20%/-15%	24 VDC +20%/-15%	24 VDC +20%/-15%	24 VDC +20%/-15%
Input Current (mA)		4	4	4	4
Response Time (ms)	OFF–ON	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
	ON–OFF	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)	1/5/10/20/70 (*1)	0.1/0.2/0.4/0.6/1 (*1)
Minimum On Voltage/Current		19 VDC/4mA	19 VDC/4mA	19 VDC/3mA	19 VDC/3mA
Maximum Off Voltage/Current		11 VDC/1.7mA	9.5 VDC/1.5mA	11 VDC/1.7mA	9.5 VDC/1.5mA
Connection Type		FCN x 1 (*2)	FCN x 1 (*2)	FCN x 2 (*2)	FCN x 2 (*2)
Points/Common		32	32	32	32
Maximum 5VDC Current Consumption (mA)		75	75	90	90
Weight (kg)		0.15	0.15	0.18	0.18
Dimensions (W x H x D) mm (in)		27.4 (1.1) x 98 (3.9) x 90 (3.5)			

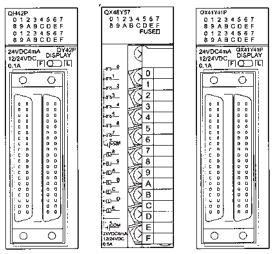
MELSEC Q Series / iQ Input Modules

Model Number		QX70	QX71	QX72	QX80	QX81	QX82	QX82-S1
Stocked Item		S	S	–	S	S	–	–
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Input Type		DC positive/negative common (sink/source)	DC positive/negative common (sink/source)	DC positive/negative common (sink/source)	DC negative common (source)	DC negative common (source)	DC negative common (source)	DC negative common (source)
No. of Input Points		16	32	64	16	32	64	64
Input Voltage		5/12VDC +20%/-15%	5/12VDC +20%/-15%	5/12VDC +20%/-15%	24VDC +20%/-15%	24VDC +20%/-15%	24VDC +20%/-15%	24VDC +20%/-15%
Input Current (mA)		1.2 / 3.3	1.2 / 3.3	1.2 / 3.3	4	4	4	4
Response Time (ms)	OFF–ON	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	0.05/0.15/0.3/ 0.55/1.05 (*1)
	ON–OFF	1/5/10/20/70 (* 1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	1/5/10/20/70 (*1)	0.15/0.2/0.35/ 0.6/1.1 (*1)
Minimum On Voltage/Current		3.5 VDC/1mA	3.5 VDC/1mA	3.5 VDC/3mA	19 VDC/3mA	19 VDC/3mA	19VDC/3mA	19VDC/3mA
Maximum Off Voltage/Current		1 VDC/0.1mA	1 VDC/0.1mA	1 VDC/0.1mA	11 VDC/1.7mA	11 VDC/1.7mA	11VDC/1.7mA	9.5VDC/1.5mA
Connection Type		Screw Terminals	FCN x 1 (*2)	FCN x 2 (*2)	Screw Terminals	D-Sub (*3)	FCN x 2 (*2)	FCN x 2 (*2)
Points/Common		16	32	32	16	32	32	32
Maximum 5VDC Current Consumption (mA)		55	70	85	50	75	90	90
Weight (kg)		0.14	0.12	0.13	0.16	0.16	0.18	0.18
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)						

Notes:
1. Set response time by parameters in GX Developer. Default is 10ms (0.2ms for -S1 versions). Input and output response times cannot be set independently.
2. 40 pin FCN connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.
3. 37 pin D-sub connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.

MELSEC Q Series / iQ Combination I/O Modules

Combination input/output modules allow both input and output points to be combined in a single module. This offers the chance to reduce the number of I/O modules, enabling a more compact system in some applications.



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User's Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Combination I/O Modules

Model Number		QH42P	QX48Y57	QX41Y41P
Stocked Item		S	S	S
Certification		UL • cUL • CE		
Input Type		DC positive common (sink)		
No. of Input Points		32	8	32
Input Voltage		24VDC +20%/-15%		
Input Current (mA)		4		
Response Time (ms)	OFF–ON	1/5/10/20/70 (*1)		
	ON–OFF	1/5/10/20/70 (*1)		
Minimum On Voltage/Current		19VDC/3mA		
Maximum Off Voltage/Current		11VDC/1.7mA		
Points/Common		32	8	32
Output Type		Sink transistor		
No. of Output Points		32	7	32
Load Voltage		12-24VDC +20%/-15%		
Maximum Load Current		0.1A/pt, 2A/common	0.5A/pt, 2A/common	0.1A/pt, 2A/common
Response Time (ms)	OFF–ON	1		
	ON–OFF	1 (rated resistive load)		
External Supply Voltage/Current		12-24VDC +20%/-15%/15mA (24VDC)/common		
Protection		Thermal & short circuit	Fused (4A), with blown fuse detection	Thermal & short circuit
Points/Common		32	7	32
Connection Type		FCN (*2)	Screw Terminals	FCN (*2)
Maximum 5VDC Current Consumption (mA)		130	80	130
Weight (kg)		0.2		
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)		

Notes:
1. Set response time by parameters in GX Developer. Default is 10ms (0.2ms for -S1 versions). Input and output response times cannot be set independently.
2. 40 pin FCN connector. Supplied separately. See "I/O Wiring Connectors" for ordering information.

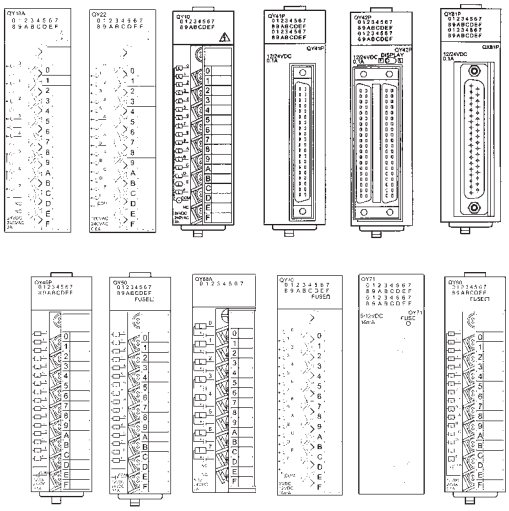
MELSEC Q Series / iQ Digital Output Modules

Digital output modules provide the CPU interface for turning devices in your system on & off under program control.

Key Features:

- Relay (contact), sink & source transistor plus triac outputs to handle all common devices
- 16, 32 or 64 outputs per module, depending on module type
- Thermal & short-circuit protection on some modules
- Internal optoisolation
- Removable terminal blocks
- Established A Series connectors (FCN/D-sub type) on 32 & 64 I/O modules for compatibility with existing A Series terminal block (A6TBXY type) installations

If you need to produce varying signal levels of voltage or current, please refer to the analog output modules section.



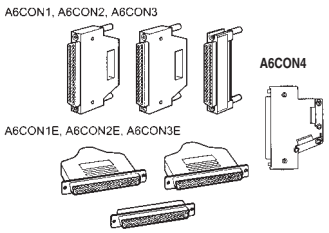
Model Number		QY10	QY18A	QY22	QY40P	QY41P	QY42P
Stocked Item		S	S	S	S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Output Type		Relay	Isolated Relay	Triac	Sink Transistor	Sink Transistor	Sink Transistor
No. of Output Points		16	8	16	16	32	64
Load Voltage		24 VDC/240 VAC	24 VDC/240 VAC	100-240 VAC, +5%	12-24 VDC, +20/-15%	12-24 VDC, +20/-15%	12-24 VDC, +20/-15%
Maximum Load Current		2A/pt, 8A/common	2A/point	0.6A/pt, 4.8A/common	0.1A/pt, 1.6A/common	0.1A/pt, 2.0A/common	0.1A/pt, 2.0A/common
Response Time (ms)	OFF–ON	10	10	1ms	1	1	1
	ON–OFF	12	12	1ms+0.5 cycle (rated resistive load)	1 (rated resistive load)	1 (rated resistive load)	1 (rated resistive load)
External Supply Voltage/Current		N/A	N/A	N/A	12-24 VDC (+20/-15%)10mA	12-24 VDC (+20/-15%), 20mA	12-24 VDC (+20/-15%), 20mA
Protection		N/A; use surge suppressor	N/A; use surge suppressor	RC surge suppressor	Thermal & short-circuit	Thermal & short-circuit	Thermal & short-circuit
Points/Common		16	All points interdependent	16	16	32	64
Connection Type		Screw Terminal	Screw Terminal	Screw Terminal	Screw Terminals	FCN (*1)	FCN x 2 (*1)
Maximum 5VDC Current Consumption (mA)		430	240	250	65	105	150
Weight (kg)		0.22	0.22	0.4	0.16	0.15	0.17
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)					

Model Number		QY50	QY68A	QY70	QY71	QY80	QY81P
Stocked Item		S	S	–	–	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Output Type		High current sink Transistor	Independent sink/source Transistor	Sink Transistor	Sink Transistor	Source Transistor	Source Transistor
No. of Output Points		16	8	16	32	16	32
Load Voltage		12-24 VDC, +20/-15%	5-24VDC, +20/-10%	5-12 VDC, +25/-10%	5-12 VDC, +25/-10%	12-24 VDC, +20/-15%	12-24 VDC, +20/-15%
Maximum Load Current		0.5A/pt, 4.0A/common	2A/pt, 8A total	16mA/pt, 256mA/common	16mA/pt, 512mA/common	0.5A/pt, 4A/common	0.1A/pt, 2A/common
Response Time (ms)	OFF–ON	1	3	0.5	0.5	1	1
	ON–OFF	1 (rated resistive load)	10 (resistive load)	0.5 (resistive load)	0.5 (resistive load)	1 (rated resistive load)	1 (rated resistive load)
External Supply Voltage/Current		12-24 VDC (+20/-15%), 20mA	N/A	5/12 VDC (+25/-10%), 90mA	5/12 VDC (+25/-10%), 170mA	12-24 VDC, +20/-15%	12-24 VDC, +20/-15%
Protection		Fuse (4A)	N/A	Fuse (1.6A)	Fuse (1.6A)	Fuse (4A)	Thermal & short-circuit
Points/Common		16	All points interdependent	16	32	16	32
Connection Type		Screw Terminals	Screw Terminals	Screw Terminals	FCN	Screw Terminals	D-sub (*1)
Maximum 5VDC Current Consumption (mA)		80	110	95	150	80	95
Weight (kg)		0.17	0.14	0.14	0.14	0.17	0.15
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)					

Notes:
1. Supplied separately. See "I/O Wiring Connectors" for ordering information.

MELSEC Q Series / iQ I/O Terminal Blocks and Covers

The 16 point Q Series I/O Modules terminal blocks and covers are available separately. Use these to replace original parts or to prepare wiring harnesses.



Model Number	Description	Stocked Item
K08H07500150	Q Series I/O terminal block assembly (screw terminals, cover door and label)	–
K08H07500151	Q Series I/O terminal block cover door and label only	–

MELSEC Q Series / iQ I/O Wiring Connectors

For the modules listed in the preceding I/O module sections, where connection type is given as “FCN” or “D-sub”, use the following connectors:

Model Number	Certification	Number of Pins	Wiring Type	Connector Type	Stocked Item
A6CON1	UL • cUL	40	Solder	FCN	S
A6CON2	UL • cUL	40	Crimp	FCN	S
A6CON3	UL • cUL	40	IDC	FCN	S
A6CON1E	UL • cUL	37	Solder	D-Sub	S
A6CON2E	UL • cUL	37	Crimp	D-Sub	–
A6CON3E	UL • cUL	37	IDC	D-Sub	–
A6CON4	—	40	Solder	FCN	–

Note: A6CON4 has a bidirectional cable clamp which allows installation depth to be reduced.

MELSEC Q Series / iQ Remote Terminal Blocks

For QXx1, QXx2, QYx1 and QYx2 type I/O modules, the following remote terminal blocks can be used to make I/O connections.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080042	I/O Module Type Building Block User’s Manual	Specifications & wiring diagrams for all Q Series digital I/O modules	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Connector / Terminal Block Converter Modules

Model Number	Details	Dimensions (W x H x D)	Applicable Models	Stocked Item
A6TBXY36	For positive common type input modules and sink type output modules (standard type)	120 x 78.5 x 52	QX41, QX41-S1, QX42, QX42-S1, QY41P, QY42P, QH42P, QX41Y41P	S
A6TBXY54	For positive common type input modules and sink type output modules (2-wire type)	155 x 78.5 x 52		–
A6TBX70	For positive common type input modules (3-wire type)	190 x 78.5 x 52	QX41, QX41-S1, QX42, QX42-S1, QX41Y41P, QH42P	–
A6TBX36-E	For negative common type input modules (standard type)	120 x 78.5 x 52	QX81	S
A6TBY36-E	For source type output modules (standard type)	120 x 78.5 x 52	QY81P	S
A6TBX54-E	For negative common type input modules (2-wire type)	155 x 78.5 x 52	QX81	–
A6TBY54-E	For source type output modules (2-wire type)	155 x 78.5 x 52	QY81P	–
A6TBX70-E	For negative common type input modules (3-wire type)	190 x 78.5 x 52	QX81	–

MELSEC Q Series / iQ Remote Terminal Block Cables

Use the following cables to make connections between QXx1, QXx2, QYx1 and QYx2 type I/O modules and the terminal blocks listed above.

Model Number	Details	Weight (kg)	Applicable Models	Stocked Item
AC05TB	0.5m (19.69 in), for sink modules	0.17	A6TBXY36 A6TBXY54 A6TBX70	S
AC10TB	1 m (39.37 in), for sink modules	0.23		
AC20TB	2 m (78.74 in), for sink modules	0.37		
AC30TB	3 m (118.11 in), for sink modules	0.51		
AC50TB	5 m (196.85 in), for sink modules	0.76		
AC80TB	8 m (314.96 in), for sink modules (common current not exceeding 0.5A)	1.2		–
AC100TB	10 m (393.7 in), for sink modules (common current not exceeding 0.5A)	1.5		–
AC05TB-E	0.5m (19.69 in), for source modules	0.17	A6TBX36-E A6TBY36-E A6TBX54-E A6TBY54-E A6TBX70-E	S
AC10TB-E	1 m (39.37 in), for source modules	0.23		
AC20TB-E	2 m (78.74 in), for source modules	0.37		
AC30TB-E	3 m (118.11 in), for source modules	0.51		
AC50TB-E	5 m (196.85 in), for source modules	0.76		–

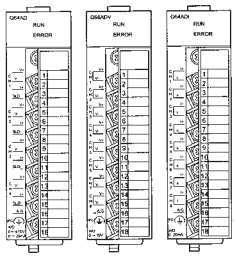
Notes:
- “-E” cables use DSUB connectors, non “-E” cables use FCN connectors.
- The number of connectable I/O points is 32 for all connector/terminal block convertor modules. Two connector/terminal block converter modules and two cables for connector/terminal block converter modules are required for 64-point I/O modules.

MELSEC Q Series / iQ Analog Input Modules

Analog input modules provide an interface to the CPU for sensing variable real world levels of voltage and current signals. These signals are converted into digital values by the modules for use in programs. This enables the CPU to process variable signals such as pressure, speed & flow. For modules able to sense temperature, please refer to the Temperature Input modules section.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-AD plug in)
- GX Configurator-AD reduces maintenance time with clear presentation of module status
- Voltage & current inputs, or exclusively voltage or current input
- 4 and 8 channel input versions
- Fast conversion (80 microseconds/channel)
- High accuracy (± 0.1%)
- High resolution (1 part in ±16,000 or 14 bits)
- Switchable resolution (1 part in ±4000, 1 part in ±12,000 & 1 part in ±16,000)
- Averaging function
- Module temperature drift compensation
- Maximum and minimum value hold



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080055	Analog-Digital Converter Module User's Manual	Covers Q64AD, Q68ADV, Q68ADI & GX-Configurator-AD	Supplied as PDF with GX-Configurator-AD	–
IB(NA)0800034E	Analog-Digital (Converter Module User's Manual (Hardware)	Basic Information on Q64AD, Q68ADV, Q68ADI	Yes	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Analog to Digital Converter Modules

Model Number		Q64AD	Q68ADV	Q68ADI
Stocked Item		S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Number of Analog Input Points		4 points (4 channels)	8 points (8 channels)	8 points (8 channels)
Analog Input	Voltage	-10 to 10VDC (input resistance value 1MΩ)		—
	Current	0 to 20mADC (input resistance value 250Ω)	—	0 to 20mADC (input resistance value 250Ω)
Digital Output		16-bit signed binary (Normal resolution mode: -4096 to 4095, high resolution mode: -12288 to 12287, -16384 to16383)		

I/O Characteristics Max. Resolution

Analog Input Range		Normal Resolution Mode: Digital Output Value	Normal Resolution Mode: Max. Resolution	High Resolution Mode: Digital Output Value	High Resolution Mode: Max. Resolution
Voltage	0 to 10V	0 to 4000	2.5mV	0 to 16000	0.625mV
	0 to 5V	0 to 4000	1.25mV	0 to 12000	0.416mV
	1 to 5V	0 to 4000	1.0mV	0 to 12000	0.333mV
	-10 to 10	-4000 to 4000	2.5mV	-16000 to 16000	0.625mV
	User range setting	-4000 to 4000	0.375mV	-12000 to 12000	0.333mV
Current	0 to 20mA	0 to 4000	5µA	0 to 12000	1.66µA
	4 to 20mA	0 to 4000	4µA	0 to 12000	1.33µA
	User range setting	-4000 to 4000	1.37µA	-12000 to 12000	1.33µA

Accuracy (Accuracy of Digital Output Value Relative to Maximum Value) (*1)

Analog Input Range		Normal Resolution Mode: Ambient Temperature 0 to 55°C, With Temp. Drift Compensation	Normal Resolution Mode: Ambient Temperature 0 to 55°C, Without Temp.Drift Compensation	Normal Resolution Mode: Ambient Temperature 25±5°C	High Resolution Mode: Ambient Temperature 0 to 55°C, With Temp. Drift Compensation	High Resolution Mode: Ambient Temperature 0 to 55°C, Without Temp.Drift Compensation	High Resolution Mode: Ambient Temperature 25±5°C
Voltage	0 to 10V	±0.3% (±12digit)	±0.4% (±16digit)	±0.1% (±48digit)	±0.3% (±48digit)	±0.4% (±64digit)	±0.1% (±16digit)
	-10 to 10						
	0 to 5V						
	1 to 5V				±0.3% (±36digit)	±0.3% (±48digit)	±0.1% (±12digit)
	User range setting						
Current	0 to 20mA						
	4 to 20mA						
	User range setting						

Conversion Time	80µs/channel (When temperature drift compensation is provided, time is 160µs longer, regardless of the number of channels used.)		
Absolute Max. Input	Voltage: ±15V, current: ±30mA		
Insulation System	Across I/O terminals and PLC power supply: Photocoupler insulation Across channels: No insulation		
Number of Occupied I/O Points	16 points (I/O allocation: 16 intelligent points)		
Connection Terminal	18-point terminal block		
Applicable Wire Size	Core: 0.3 to 0.75mm^2 , OD: 2.8mm (0.11 inch) max.		
Applicable Crimping Terminal	R1.25-3 (sleeved crimping terminal cannot be used)		
Internal Current Consumption (5VDC) (A)	0.63	0.64	0.64
Weight (kg)	0.18	0.19	0.19
Dimensions (W x H x D) mm (in)	27.4 x 98 x 90 (1.1 x 3.9 x 3.5)		

Notes:

1. "Digit" indicates a digital value. ±4 digit means that the digital value 1000 will vary between 996 and 1004.

MELSEC Q Series / iQ High Resolution Isolated Analog Input Modules

For some applications, it is essential that there is channel-to-channel isolation between analog inputs. These modules provide galvanic isolation between each channel so there is no common connection from one channel to any other. Additionally, they also offer 16 bits of resolution to accurately sense the minutest changes in an analog signal.

High Resolution Analog Module (Isolated Analog Input Channels)

Model Number		Q64AD-GH
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Input Points		4 points (4 channels)
Analog Input	Voltage	-10 to 10 VDC (Input resistance 1MΩ)
	Current	0 to 20 mADC (Input resistance 250Ω)
Digital Output		16-bit signed binary (-32768 to 32768); 32-bit signed binary (-65536 to 65536)
I/O Characteristics Maximum Resolution		See table below
Accuracy (Accuracy Relative to Full-Scale)	Reference Accuracy (*1)	±0.05%; Digital output value(32 bit): ±32 digit (*2); Digital output value (16 bit): ±16 digit (*2)
	Temp. Coefficient (*3)	±71.4 ppm / °C (0.00714% / °C)
Common Mode Characteristic		Common mode voltage input – Common ground (Input voltage 0V): 1780 VAC; Common mode voltage rejection ratio (VCM < 1780V): 60Hz 105dB, 50 Hz 107 dB
Conversion Speed		10ms / 4 channels
Absolute Maximum Input		Voltage: ± 15V; Current: ± 30mA
Withstanding Voltage Isolation Method		Between I/O terminal and PLC power supply: Photocoupler insulation; Between analog input channels: transformer isolation
Dielectric Strength		1780 VAC ms / 3 cycles (elevation 2000m)
Isolation Voltage		Between I/O terminal and PLC power supply: 500 VDC 20MΩ more
EEPROM Write Count		Maximum 100,000
Number of I/O Occupied Points		16 points
Connected Terminal		18 points terminal block
Applicable Wire Size		0.3 to 0.75mm²
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.89 A
Weight		0.20 kg
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)

I/O Characteristics Maximum Resolution

Input	Analog Input Range	Maximum Resolution		Digital Output Value (32-Bit)	Digital Output Value (16-Bit)
		32-Bit	16-Bit		
Voltage	0 to 10V	156.3 µV	312.6 µV	0 to 64000	0 to 32000
	0 to 5V	78.2 µV	156.4 µV		
	1 to 5V	62.5 µV	125.0 µV		
	Users Input Range (Uni-Polar)	47.4 µV	94.8 µV		
	-10 to 10V	156.3 µV	312.6 µV	-64000 to 64000	-32000 to 32000
	Users Input Range (Bi-Polar)	47.4 µV	94.8 µV		
Current	0 to 20 mA	312.5nA	625.0 µV	0 to 64000	0 to 32000
	4 to 20 mA	250.0nA	500.0 µV		
	Users Input Range (Uni-Polar)	151.6nA	303.2 µV		

Notes:
1. Accuracy when consistent at some temperature within the ambient temperature (to 55°C)
2. "Digit" indicates a digital output value.
3. Accuracy per temperature change of 1°C.
   Example: Accuracy when temperature change from 25 to 30°C. 0.05% (reference accuracy + 0.00714% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.0857%

Required Manuals

Model Number	Description	Contents	Included?	Stk Item
SH(NA)080277	Channel Isolated High Resolution Analog-Digital Converter Module User's Manual	Covers Q64AD-GH, Q62AD-DGH & GX Configurator-AD	Supplied as PDF with GX Configurator-AD	–
IB(NA)0800223	Q64AD-GH Channel Isolated High Resolution Analog-Digital Converter Module	Basic information on Q64AD-GH	Yes	–

High Resolution Analog Module (Isolated Analog Input Channels with Signal Conditioning Function)

Model Number			Q62AD-DGH
Stocked Item			S
Certification			CE
Connecting Section With 2-Wire Transmitter	Input Specification	Number of Analog Input	2 points (2 channels)
		Analog Input	4 to 20 mADC (*1) (Input resistance 250 Ω)
	Supply Power Specification	Supply Voltage	26 ±2VDC
		Maximum Supply Current	24mADC
		Short-Circuit Protection	Available; Limit current: 25 to 35mA
	Check Terminals		Available
Digital Output			16-bit signed binary (-768 to 32767); 32-bit signed binary (-1538 to 65535)
I/O Characteristics Maximum Resolution			See table below
Accuracy (Accuracy Relative to Full-Scale)		Reference Accuracy (*2)	±0.05%; Digital output value(32 bit): ±32 digit (*3); Digital output value (16 bit): ±16 digit (*3)
		Temp. Coefficient (*4)	±71.4 ppm / °C (0.00714% / °C)
Conversion Speed			10ms / 2 channels
Insulation			See table below
EEPROM Write Count			Maximum 100,000
Number of I/O Occupied Points			16 points
Connected Terminal			18 points terminal block
Applicable Wire Size			0.3 to 0.75mm^2
Applicable Solderless Terminals			R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)			0.33 A
External Power Supply			24 VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.5A, within 200µs; 0.19A
Weight			0.19 kg
Dimensions (W x H x D) mm (in)			27.4 x 98 x 90 (1.1 x 3.9 x 3.5)

Analog Input Range	Maximum Resolution		Digital Output Value (32-Bit)	Digital Output Value (16-Bit)
	32-Bit	16-Bit		
4 to 20mA	250.0nA	500.0nA	0 to 64000	0 to 32000
User range Setting	151.6nA	303.2nA		

Isolated Part	Insulation Method	Dielectric Strength	Isolation Voltage
Between I/O Terminal and PLC Power Supply	Photocoupler Insulation	1780 VAC rms / 3 cycles (elevation 2000m)	500 VDC 10MΩ or more
Between Analog Input Channels	Transformer Isolation		
Between External Power Supply and Analog Input	Transformer Isolation		

Notes:
1. User range setting is 2 to 24mA
2. Accuracy of offset/gain setting at ambient temperature. Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy)
3. "Digit" indicates a digital output value.
4. Accuracy per temperature change of 1°C.
   Example: Accuracy when temperature change from 25 to 30°C. 0.05% (reference accuracy + 0.00714% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.0857%

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080277	Channel Isolated High Resolution Analog-Digital Converter Module User's Manual	Covers Q64AD-GH, Q62AD-DGH & GX Configurator-AD	Supplied as PDF with GX Configurator-AD	–
IB(NA)0800224	Channel Isolated High Resolution Analog-Digital Converter Module (with Signal Conditioning Function)	Basic information on Q62AD-DGH	Yes	–

High Resolution Analog Module (Isolated Analog Output Channels with Output Monitor)

Model Number		Q62DA-FG
Stocked Item		S
Certification		UL • cUL • CE
Number of Analog Outputs		2 points (2 channels)
Digital Input		16-bit signed binary (-12288 to 12287, -16384 to 16383)
Analog Output	Voltage	-12 to 12 VDC (External load resistance 1k to 1MΩ)
	Current	0 to 20 mADC (External load resistance: 0 to 600Ω); 0 to 22 mADC
I/O Characteristics Maximum Resolution		See table below
Accuracy (Accuracy Relative to Maximum Analog Output Value)	Reference Accuracy (*1)	within ±0.1%; (Voltage: ±10mV, Current: ±20μA)
	Temp. Coefficient (*2)	±80 ppm / °C (0.008% / °C)
Conversion Speed		10ms / 2 channels
Absolute Maximum Output	Voltage	±13V
	Current	23 mA
Output Monitor	Resolution	12 bit
	Reference Accuracy (*1)	±0.2%
	Temperature Coefficient (*2)	±160ppm / °C (0.016% / °C)
Output Short-Circuit Protection		Available
EEPROM Write Count		Maximum 100,000
Number of I/O Points Occupied		16 points
Isolation Specifications		See table below
Connected Terminal		18 points terminal block
Applicable Wire Size		0.3 to 0.75mm²
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.37A
External Power Supply		24 VDC +20%, -15%; Ripple, spike within 500mVp-p; Inrush current: 5.2A, within 300μs, 0.3A
Weight		0.20 kg
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.1 x 3.9 x 3.5)

	Analog Output Range	Digital Input Value	Maximum Resolution
Voltage	0 to 5V	0 to 12000	0.416mV
	1 to 5V		0.333mV
	-10 to 10V	-16000 to 16000	0.625mV
	User Range Setting 2	-12000 to 12000	0.366mV
	User Range Setting 3		0.183mV
Current	0 to 20 mA	0 to 12000	1.66μA
	4 to 20 mA		1.33μA
	User Range Setting 1	-12000 to 12000	0.671μA

Isolated Part	Isolation Method	Dielectric Strength	Insulation Resistance
Between I/O Terminal and Controller Power Supply	Photocoupler Insulation	1780 VAC rms / 3 cycles (elevation 2000m)	500 VDC 10MΩ or more
Between Analog Output Channels	Transformer Isolation		
Between External Power Supply and Analog Output	Transformer Isolation		

Notes:
1. Accuracy of offset/gain setting at ambient temperature Q62AD-DGH needs to be powered on 30 minutes prior to operation for compliance to the specification (accuracy).
2. Accuracy per temperature change of 1°C.
   Example: Accuracy when temperature change from 25 to 30°C. 0.1% (reference accuracy + 0.008% / °C (temperature coefficient) x 5 °C (temperature change difference) = 0.14%

Required Manuals

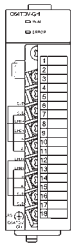
Model Number	Description	Contents	Included?	Stk Item
SH(NA)080281	Channel Isolated Digital-Analog Converter Module Q62DA-FG/GX Configurator-DA	Covers Q62DA-FG/GX Configurator-DA	Supplied as PDF with GX Configurator-DA	–
IB(NA)0800277	Channel Isolated Digital-Analog Converter Module Q62DA-FG	Basic information on Q62DA-FG	Yes	–

MELSEC Q Series / iQ High Resolution Isolated Input Thermocouple Module

Thermocouple input modules are a specialized version of the more general-purpose analog input modules. These modules are designed to accept the specialized voltage signals generated by a wide variety of standard thermocouples. This allows the temperatures monitored by thermocouple sensors to be converted into digital values for use in CPU programs.

Key Features:

- Fully isolated inputs prevent interference between input signals
- Microvolt input capability for compatibility with load cell applications
- 16 bit resolution
- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-TI plug in)
- GX Configurator-TI reduces maintenance time with clear presentation of module status
- 4 channels
- Supports K, E, J, T, B, R, S & N type thermocouples
- Set channel thermocouple type individually
- Disconnection detection
- Increase conversion speed by disabling unused channels
- Three data processing methods
- Offset/gain setting
- Out of range warning
- Pt100 cold junction compensation



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080141	Thermocouple Input Module Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual Q64TD Q64TDV-GH GX Configurator-TI	Covers Q64TD, Q64TDV-GH & GX Configurator-TI	Supplied as PDF with GX Configurator-TI	–
IB(NA)080155	Thermocouple Input Module Channel Isolated Thermocouple/Micro Voltage Input Module User's Manual (Hardware) Q64TD, Q64TDV-GH	Basic information Q64TD, Q64TDV-GH	Yes	–

High Resolution Analog Module (Isolated Thermocouple and Millivolt Inputs)

Model Number		Q64TDV-GH
Stocked item		S
Certification		CE
Number of Channels		4 channels
Output	Temperature Conversion Value	16-bit, signed binary (-2700 to 18200: Value to the first decimal place x 10 times)
	Micro Voltage Conversion Value	16-bit, signed binary (-25000 to 25000)
	Scaling Value	16-bit, signed binary
Standard With Which Thermocouple Conforms		JIS C1602-1995
Usable Thermocouples		B, R, S, K, T, E, J, N
Cold Junction Temperature Compensation Accuracy		±1.0 °C
Thermocouple Input Accuracy		As per calculation expression marked (*1)
Micro Voltage Input Range		-100mV to +100mV (input resistance 2MΩ or more)
Micro Voltage Input Accuracy		±0.2mV (at 25° C ambient) ±0.8 mV (0–55°C ambient)
Resolution	Thermocouple Input	B: 0.7°C • R,S: 0.8°C • K,T: 0.3°C • E: 0.2°C • J: 0.1°C • N: 0.4°C
	Micro Voltage Input	4μV
Sampling Period		20ms/channel (*2)
Conversion Speed		Sampling period x 3 (*3)
Number of Analog Input Points		4 channels + Pt100 connection channel/module
Absolute Maximum Input		±5V
Insulation System		Across thermocouple input/micro voltage input and earth: Transformer insulation Across thermocouple input/micro voltage input channels: Transformer insulation Across cold junction temperature compensation input (Pt100) and earth: No insulation
Dielectric Withstand Voltage		1780VrmsAC/3 cycles (altitude 200m)
Insulation Resistance		Across thermocouple input/micro voltage and earth: 500 VDC 100MΩ or more using insulation resistance tester Across thermocouple input/micro voltage input channels: 500 VDC 10MΩ or more using insulation resistance tester
Wire Break Detection		Yes (Each channel independent)
EEPROM Write Count		Maximum 100,000 times
Number of Occupied Points		16 points
Connection Terminals		18-point terminal block
Applicable Wire Size		0.3 to 0.75 mm²
Applicable Crimping Terminals		R1.25-3 R1.25-3 (A solderless terminals with sleeves cannot be used)
Internal Current Consumption (5VDC)		0.50 A
Weight		0.25 kg
Dimensions (W x H x D) mm (in)		27.4 x 98 x 112 (1.08 x 3.86 x 4.41)

Notes:

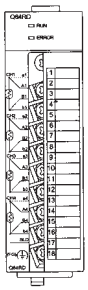
1. Calculate the accuracy in the following method. (Accuracy) = (conversion accuracy) + (temperature characteristic) x (operating ambient temperature variation) + (cold junction temperature compensation accuracy). An operating ambient temperature variation indicates a deviation of the operating ambient temperature from the 25 ±5°C range. Example: When the thermocouple used is a B type, the operating ambient temperature is 35°C, and the measured temperature is 1000°C, the accuracy is: (±3.5°C) + (±0.4°C) x (5°C) + (±1°C) = 6.5°C
2. A period until a thermocouple input value/micro voltage input value is converted into a temperature measurement micro/value voltage conversion value.
3. A period until a thermocouple input value/micro voltage input value is converted into a temperature measurement value/micro voltage conversion value and the resultant value is stored into the buffer memory. The conversion speed is a delay time that occurs during sampling processing. It is independent of averaging processing. Example: When two channels are enabled for conversion (Conversion speed) = (sampling period) x 3 = (20ms x 2 channels) x 3 = 120 ms.

MELSEC Q Series / iQ RTD Input Module

RTD input modules offer an alternative to thermocouple input modules. These work with platinum resistance temperature device (RTD) sensors. Note that RTD sensors are typically a narrower temperature range than that offered by thermocouples.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-TI plug in)
- GX Configurator-TI reduces maintenance time with clear presentation of module status
- 4 channels
- Supports Pt100 & JPt100 devices
- Disconnection detection
- Increase conversion speed by disabling unused channels
- Three data processing methods
- Offset/gain setting
- Out of range warning



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080142	Thermocouple Input Module User's Manual	Covers Q64RD & GX Configurator-TI	Supplied as PDF with GX Configurator-TI	–
IB(NA)0800156	Thermocouple Input Module User's Manual (Hardware)	Basic information on Q64RD	Yes	–

Note: Many of these manuals are available by free download from our website, www.meau.com

RTD Input Module

Model Number		Q64RD
Stocked Item		S
Certification		UL • cUL • CE
Number of Channels		4 channels
Output	Temperature Conversion Value	16-bit, signed binary data (-2000 to 8500: Value to the first decimal place x10 times) 32-bit, signed binary data (-200000 to 850000: Value to the third decimal place x1000 times)
	Scaling Value	16-bit, signed binary
Usable Platinum Temperature-Measuring Resistors		Pt100 (JIS C1604-1997, IEC 751 1983), JPt100 (JIS C1604-1981)
Measured Temperature Range	Pt100	-200 to 850°C
	JPt100	-180 to 600°C
Range Changing	Pt100	-20 to 120°C/ -200 to 850°C
	JPt100	-20 to 120°C/ -180 to 600°C
Accuracy (*1)	Ambient Temperature 0 to 55°C	± 0.25% (accuracy relative to full-scale value)
	Ambient Temperature 25 ±5°C	± 0.08% (accuracy relative to full-scale value)
Resolution		0.025°C
Conversion Speed		40ms/channel (*2)
Number of Analog Input Points		4 channels/module
Temperature Detecting Output Current		1mA
Insulation System		Between platinum temperature-measuring resistor input and PLC power supply : Transformer insulation Between platinum temperature-measuring resistor input channels : No insulation
Dielectric Withstand Voltage		1780VrmsAC/3 cycles (altitude 2000m (6557.38 feet))
Insulation Resistance		Between thermocouple input and earth : 500 VDC 10MΩ or more using insulation resistance tester Between thermocouple input channels : 500 VDC 10MΩ or more using insulation resistance tester
Wire Break Detection		Yes (Each channel individually) (*3)
Number of Occupied Points		16 points
Connection Terminals		18-point terminal block
Applicable Wire Size		0.3 to 0.75mm^2
Applicable Crimping Terminals		1.25-3 R1.25-3 (Sleeved crimping terminals are not useable)
Cables Between Q64RD and Platinum Temperature-Measuring Resistor		Total resistance 2kΩ or less
Internal Current Consumption (5VDC) (A)		0.60
Weight (kg)		0.17
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.55)

Notes:

1. The selection ranges and accuracies have the following relationships.

Ambient Temperature	Pt100 and JPt100 : -20 to 120°C	Pt100 : -200 to 850°C	JPt100 : -180 to 600°C
0 to 55°C	± 0.3°C	± 2.125°C	± 1.5°C
25 ± 5°C	± 0.096°C	± 0.68°C	± 0.48°C

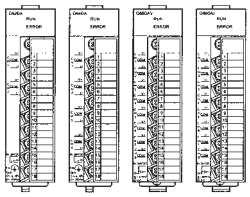
2. The conversion speed is a period from when a temperature is input and converted into a corresponding digital value until the value is stored into the buffer memory. When two or more channels are used, the conversion speed is "40ms x number of conversion enabled channels".
3. At wire break detection, the temperature conversion value right before wire break occurrence is held.

MELSEC Q Series / iQ Analog Output Modules

Analog output modules allow the CPU to convert digital program values to real world analog current or voltage signals. These can then be used to control actuators whose properties vary between set limits, such as valve openings, speed control, extension distance, etc.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-DA plug in)
- GX Configurator-DA reduces maintenance time with clear presentation of module status
- 2, 4 & 8 channel versions
- Fast conversion (80 microseconds/channel)
- High accuracy (±0.1%)
- High resolution (1 part in +/-16,000 or 14 bits)
- Switchable resolution (1 part in ±4000, 1 part in +/-12,000 & 1 part in ±16,000)
- Variable offset/gain
- Synchronous output function establishes output changes on a set timebase
- Output hold/clear function
- Output test when CPU is in STOP mode



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080054	Digital-Analog Converter Module User's Manual	Covers Q62DAN, Q64DAN, Q68DAVN, Q68DAIN GX Configurator-DA	Supplied as PDF with GX Configurator-DA	–
IB(NA)0800321E	D/A Converter Module Users' Manual (Hardware)	Basic information on Q62DAN, Q64DAN, Q68DAVN, Q68DAIN	Yes	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Q Series Analog Output Modules

Model Name		Q62DAN	Q64DAN	Q68DAVN	Q68DAIN
Stocked Item		S	S	S	S
Number Of Analog Output Points		2 points (2 channels)	4 points (4 channels)	8 points (8 channels)	
Digital Input		16-bit signed binary (normal resolution mode: -4096 to 4095, High resolution mode: -12288 to 12287, -16384 to 16383)			
Analog Output	Voltage	–10 to 10 VDC (External load resistance value: 1KΩ to 1MΩ)			—
	Current	0 to 20 mA DC (External load resistance value: 0Ω to 600Ω)		—	0 to 20 mA DC (External load resistance value: 0Ω to 600Ω)
I/O Characteristics, Maximum Resolution					

Analog output range		Normal resolution mode		High resolution mode	
		Digital input value	Maximum resolution	Digital input value	Maximum resolution
Voltage	0 to 5V	0 to 4000	1.25 mV	0 to 12000	0.416 mV
	1 to 5V		1.0 mV		0.333 mV
	-10 to 10V	-4000 to 4000	2.5 mV	-16000 to 16000	0.625 mV
	User range setting		0.75 mV	-12000 to 12000	0.333 mV
Current	0 to 20 mA	0 to 4000	5µA	0 to 12000	1.66µA
	4 to20 mA		4µA		1.33µA
	User range setting	-4000 to 4000	1.5µA	-12000 to 12000	0.83µA

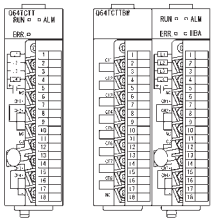
Accuracy (Accuracy With Respect To Maximum Analog Output Value)	Ambient Temp. 25 ±5 °C	Within ± 0.1 % (Voltage: ±10 mV, Current: ± 20µA)			
	Ambient Temp. 0 to 55 °C	Within ± 0.3 % (Voltage: ± 30 mV, Current: ± 60µA)			
Conversion Speed		80µs/channel			
Absolute Maximum Output	Voltage	±12V			—
	Current	21 mA		—	21 mA
EEPROM Write Count		Max. 100 thousand times			
Output Short Circuit Protection		Available			
Insulation Method		Between the I/O terminal and PLC power supply: Photocoupler isolation Between output channels: No isolation Between external supply power and analog output: Transformer isolation			
Dielectric Withstand Voltage		Between the I/O terminal and PLC power supply :500VAC for 1 minute; Between external supply power and analog output :500VAC for 1 minute			
Insulation Resistance		Between the I/O terminal and PLC power supply : 500VDC 20MΩ or more; Between external supply power and analog output :500VDC 20MΩ or more			
I/O Occupied Points		16 points (I/O assignment: Intelligent 16 points)			
Connected Terminals		18-points terminal block			
Applicable Wire Size		0.3 to 0.75 mm^2			
Applicable Solderless Terminal		R1.25-3 (A solderless terminal with sleeve cannot be used)		FG terminal: R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A Other terminals than FG: R1.25-3 (A solderless terminal with sleeve cannot be used)	
External Supply Power		24 VDC + 20 %, -15 %			
		Ripple, spike 500 mV P-P or less			
		Inrush current: 2.5 A, within 250µs	Inrush current: 2.5 A, within 260µs	Inrush current: 2.5 A, within 230µs	Inrush current: 2.5 A, within 230µs
		0.15 A	0.24 A	0.20 A	0.27 A
Internal Current Consumption (5VDC)		0.33 A	0.34 A	0.38 A	0.38 A
Weight (kg)		0.19	0.20	0.20	0.20

MELSEC Q Series / iQ Temperature Control Modules

Temperature Controller modules are specialized modules that are intended for closed loop control of temperature in process control applications. They accept either thermocouple or RTD input devices. The modules incorporate programmable PID algorithms to allow the modules to maintain set temperatures independently of the CPU programs. The modules also provide outputs that operate under control of the PID algorithms to maintain control of heaters.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-TC plug in)
- GX Configurator-TC reduces maintenance time with clear presentation of module status
- Auto-tuning PID capability simplifies configuration
- Four PID loops per module
- Reset Feedback (RFB) limiter to suppress overshooting at startup or an increase in set value
- Resolution of 0.1 degree Celsius or 0.1 degree Fahrenheit
- Sensor disconnection detection on certain modules



Required Manuals

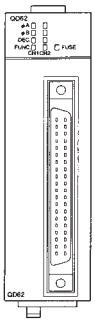
Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080121	Temperature Control Module User's Manual	Covers Q64TCTT, Q64TCTTBW, Q64TCRT, Q64TCRTBW & GX Configurator-TC	Supplied as PDF with GX Configurator-TC	–
IB(NA)0800120	Q64TCTT & Q64TCTTBW User's Manual (Hardware)	Basic information on Q64TCTT & Q64TCTTBW	Yes (Q64TCTT & Q64TCTTBW only)	–
IB(NA)0800121	Q64TCRT & Q64TCRTBW User's Manual (Hardware)	Basic information on Q64TCRT & Q64TCRTBW	Yes (Q64TCRT & Q64TCRTBW only)	–

Q Series / iQ Temperature Control Modules

Model Number		Q64TCTT	Q64TCRT	Q64TCTTBW	Q64TCRTBW
Stocked Item		S	S	S	–
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Control Output		Transistor output			
Number of Temperature Input Points		4 channels/module			
Usable Thermocouples/Platinum Temperature-Measuring Resistors		R, K, J, T, S, B, E, N, U, L, PLII, W5Re/W26Re	Pt100, JPt100	R, K, J, T, S, B, E, N, U, L, PLII, W5Re/W26Re	Pt100, JPt100
Accuracy	Ambient Temp. 25°C ± 5°C	Input range width x (±0.3%)			
	Ambient Temp. 0°C to 55°C	Input range width x (±0.7%)			
Cold Junction Temperature Accuracy Compensation	Ambient Temp. 0°C to 55°C	Within ±1.0°C	—	Within ±1.0°C	—
	Ambient Temp. -100°C to -150°C	Within ±2.0°C	—	Within ±2.0°C	—
	Ambient Temp. -150°C to -200°C	Within ±3.0°C	—	Within ±3.0°C	—
Sampling Period		0.5s/4 channels (constant independently of the number of channels used)			
Control Output Period		1 to 100s			
Input Impedance		1MΩ			
Input Filter		0 to 100s (0: Input filter off)			
Sensor Compensation Value Setting		-50.00 to 50.00%			
Operation at Sensor Input Disconnection		Upscale processing			
Temperature Control System		PID ON/OFF pulse or 2-position control			
PID Constant Range	PID Constant Setting	Setting can be made by auto tuning			
	Proportional Band (P)	0.0 to 1000.0% (0: 2-position control)			
	Integral Time (I)	1 to 3600s			
	Derivative Time (D)	0 to 3600s (set 0 for PI control)			
Set Value Setting Range		Within temperature range set to the used thermocouple/platinum temperature-measuring resistor			
Dead Band Setting Range		0.1 to 10.0%			
Transistor Output	Output Signal	ON/OFF pulse			
	Rated Load Voltage	10 to 30 VDC			
	Max. Load Current	0.1A/point, 0.4A/common			
	Max. Inrush Current	0.4A 10ms			
	Leakage Current at OFF	0.1mA or less			
	Max. Voltage Drop at ON	1.0 VDC (TYP) 0.1A 2.5 VDC (MAX) 0.1A			
	Response Time	OFF–ON : 2ms or less, ON–OFF : 2ms or less			
Insulation Method		Between input and grounding: Transformer insulation between input and channel: Transformer insulation			
Dielectric Strength		Between input and grounding: 500 VAC for 1 minute between input and channel: 500 VAC for 1 minute			
Insulation Resistance		Between input and grounding: 500 VDC 20MΩ or more between input and channel: 500 VDC 20MΩ or more			
Heater Disconnection Detection Specs.	Current Sensor (*)	—		The following current sensors of URD, Ltd. CTL-12-S36-8 (0.0 to 100.0A • CTL-6-P-H (0.00 to 20.00A)	
	Input Accuracy	—		Input range width (±1.0%)	
	Number of Alert Delays	—		3 to 255	
Number of Occupied I/O Points		16 points/slot (I/O assignment: 16 intelligent points)		32 points/2 slots (Default I/O assignment: 16 free points + 16 intelligent points)	
Connection Terminal		18-point terminal block		Two 18-point terminal blocks	
Applicable Wire Size (mm²)		0.3 to 0.75			
Applicable Crimping Terminal		R1.25-3, 1.25-YS3, RAV1.25-3, V1.25-YS3A			
Internal Current Consumption (A)		0.55		0.64	
Weight (kg)		0.20		0.30	
Dimensions (W x H x D) mm (in)		27.4 x 98 x 112 (1.08 x 3.86 x 4.41)		55.2 x 98 x 112 (2.17 x 3.86 x 4.41)	

Note: Use only URD's current sensors. In North America contact URD via www.urdamerica.com

MELSEC Q Series / iQ High Speed Counter Modules



These modules provide a capability for the CPUs to sense high frequency pulse trains as would be found in motion control and similar applications. Typically these modules would be linked to encoders to provide a closed loop of position sensing on a motion axis.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-CT plug in)
- External selection of count function capability
- GX Configurator-CT reduces maintenance time with clear presentation of module status
- Up to 0.5MHz count frequency (depending on model)
- 32 bit count range
- Single phase & quadrature input
- Preset count functions (linear, ring, sample, periodic)
- Built-in outputs for direct actuation of external processes
- CW/CCW detection

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080036	High Speed Counter Module User's Manual	Covers QD62, QD62E, QD62D & GX Configurator-CT	Supplied as PDF with GX	–
IB(NA)0800059	High Speed Counter Module User's Manual (Hardware)	Basic information on QD62, QD62E, QD62D	Yes	–

Note: Many of these manuals are available by free download from our website, www.meau.com

MELSEC Q Series / iQ High Speed Counter Modules

Model Number			QD62	QD62E	QD62D
Stocked Item			S	S	S
Certification			UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Compatible Encoder Types (*2) (*3)			Open collector type/CMOS type	Open collector type/CMOS type	Line driver type
Counting Speed Switch Setting			200k (100k to 200kPPS) 100k (10k to 100kPPS) 10k (10kPPS max.)		500k (200k to 500kPPS) 200k (100k to 200kPPS) 100k (10k to 100kPPS) 10k (10kPPS max.)
Number of Channels			2 channels		
Count Input Signal	Phase		1 phase input, 2 phase input		
	Rated Input Voltage		5/12/24 VDC (positive or negative common)		EIA Standard RS-422-A Differential line driver (*1) level
	ON / OFF Character.	5V	ON: 4.5 to 5.5V/2 to 5mA, OFF: 2V max./0.1mA max.		
		12V	ON: 10.8 to 13.2V/2 to 5mA, OFF: 4V max./0.1mA max.		
		24V	ON: 21.6 to 26.4V/2 to 5mA, OFF: 5V max./0.1mA max.		
	Counting Range		32-bit designated binary (-2147483648 to 2147483647)		
	Type		UP/DOWN preset counter + ring counter functions		
	Counting Speed		Refer to the separate list: counting speeds		
External Input	Rated Input Voltage		5/12/24 VDC (positive or negative common)		5/12/24V (*2)
	ON / OFF Character.	5V	ON: 4.5 to 5.5V/2 to 5mA, OFF: 2V max./0.1mA max		ON: 2.5 to 5.5V/2 to 5mA, OFF: 1V max./0.1mA max.
		12V	ON: 10.8 to 13.2V/2 to 5mA, OFF: 4V max./0.1mA max.		
		24V	ON: 21.6 to 26.4V/2 to 5mA, OFF: 5V max./0.1mA max.		
	Response Time		OFF ON: 0.5ms max., ON OFF: 1ms max.		
Coincidence Output	Comparison Range		32-bit designated binary (-2147483648 to 2147483647)		
	Comparison System		Set value < count value, set value = count value, set value>count value		
	Number of Points		2 points/channel	2 points/channel	2 points/channel
	Output Rating		Transistor (sink) 12/24 VDC 0.5A/point 2A/common	Transistor (source) 12/24 VDC 0.1A/point 0.4A/common	Transistor (sink) 12/24 VDC 0.5A/point 2A/common
	Max. Voltage Drop		1.5V		
	Response Time	OFF–ON	0.1ms max.	0.3ms max.	0.1ms max.
		ON–OFF	0.1ms max. (rated load, resistive load)	0.3ms max. (rated load, resistive load)	0.1ms max. (rated load, resistive load)
	External Supply Power		Voltage range: 10.2 to 30V, current consumption: 8mA (typ @24 VDC)		
	External Wiring Protection		Fuse protection		
Number of Occupied I/O Points			16 points (I/O assignment: 16 intelligent points)		
5VDC Internal Current Consumption (A)			0.30	0.33	0.38
Weight (kg)			0.11		0.12
Dimensions (W x H x D) mm (in)			27.4 x 98 x 90 (1.08 x 3.86 x 3.55)		

Notes:
1. Japan Texas Instruments product model Am26LS31 or equivalent
2. Insure encoder output voltages are compatible with the module's input specifications.
3. TLL output type encoders cannot be used with the QD62, QD62E, and QD62D.

MELSEC Q Series / iQ High Speed Counter Modules

QD62

Counting Speed Switch Setting	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2		
t=1.25µs or less	200kPPS	100kPPS	10kPPS
t=2.5µs or less	100kPPS	100kPPS	10kPPS
t=25µs or less	—	10kPPS	10kPPS
t=500µs	—	—	500PPS

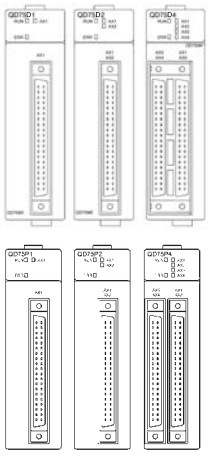
QD62E

Counting Speed Switch Setting	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2		
t=1.25µs or less	200kPPS	100kPPS	10kPPS
t=2.5µs or less	100kPPS	100kPPS	10kPPS
t=25µs or less	—	10kPPS	10kPPS
t=500µs	—	—	500PPS

QD62D

Counting Speed Switch Setting	500kPPS	200kPPS	100kPPS	10kPPS
Rise/Fall time	Both Phases 1 and 2			
t=0.5µs or less	500kPPS	200kPPS	100kPPS	10kPPS
t=1.25µs or less	200kPPS	200kPPS	100kPPS	10kPPS
t=2.5µs or less	—	100kPPS	100kPPS	10kPPS
t=25µs or less	—	—	10kPPS	10kPPS
t=500µs	—	—	—	500PPS

Note: Inputting a waveform with a long rise/fall time may cause a false input. Use a waveform within the permissible rise/fall time.



MELSEC Q Series / iQ Positioning Modules

One of Q Series' strengths is the ability to integrate positioning directly onto your system. If a Q Series motion CPU is not required, the following modules provide a range of alternative positioning control capabilities in a range of formats.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-QP plug in)
- GX Configurator-QP reduces maintenance time with clear presentation of module status
- One, two and four axis versions available
- Open collector, differential driver and SSCNET versions available
- 1MHz output capability
- 4 axis linear interpolation
- Circular interpolation
- Variety of control schemes (point to point, fixed feed, speed, speed/position and position/speed)

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080172	GX Configurator-QP Version 2 Operating Manual	Covers GX Configurator-QP for all Q Series motion control modules (P/D/M)	Supplied as PDF with GX Configurator-QP	–
IB(NA)0800063	QD75P/D1, 2 & 4 Users' Manual (Hardware)	Basic information on QD75P/ D1, 2 & 4	Supplied with QD75P/D1, 2 & 4	–
SH(NA)080058	QD75P/QD75D Positioning Module User's Manual	Covers QD75P/D 1, 2 & 4	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

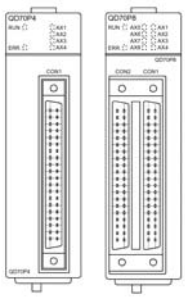
MELSEC Q Series / iQ Motion Control Modules

Model Number		QD75P1 (*1) QD75D1	QD75P2 (*1) QD75D2	QD75P4 (*1) QD75D4
Stocked Item		–	S	S
Number of Control Axes		1 axis	2 axes	4 axes
Interpolation Function		No	2-axis linear interpolation 2-axis circular interpolation	2-, 3-, or 4-axis linear interpolation 2-axis circular interpolation
Control System		PTP (Point To Point) control, path control (both linear and arc can be set), speed control, speed-position switching control, position-speed switching control		
Control Unit		mm, inch, degree, pulse		
Positioning Data		600 data (positioning data Nos. 1 to 600)/axis (Can be set with peripheral device or sequence program.)		
Backup		Parameters, positioning data, and block start data can be saved on flash ROM (battery-less backup).		
Positioning	Positioning System	PTP control: Incremental system/absolute system Speed-position switching control: Incremental system/absolute system (*2) Position-speed switching control: Incremental system Path control: Incremental system/absolute system		
	Position Range	**In absolute system** • -214748364.8 to 214748364.7(m) • -21474.83648 to 21474.83647(inch) • 0 to 359.99999(degree) • -2147483648 to 2147483647(pulse) **In incremental system** • -214748364.8 to 214748364.7(m) • -21474.83648 to 21474.83647(inch) • -21474.83648 to 21474.83647(degree) • -2147483648 to 2147483647(pulse) **In speed-position switching control (INC mode) / position-speed switching control** • 0 to 214748364.7(m) • 0 to 21474.83647(inch) • 0 to 21474.83647(degree) • 0 to 2147483647(pulse) **In speed-position switching control (ABS mode)** • 0 to 359.99999(degree)		
	Speed Command	0.01 to 20000000.00(mm/min) 0.001 to 2000000.000(inch/min) 0.001 to 2000000.000(degree/min) 1 to 1000000(pulse/s)		
	Acceleration/Deceleration Process	Automatic trapezoidal acceleration/deceleration, S-pattern acceleration/deceleration		
	Acceleration/Deceleration Time	1 to 8388608 (ms) Four patterns can be set for each of acceleration time and deceleration time		
	Sudden Stop Deceleration Time	1 to 8388608 (ms)		
Protective Degree		IP2X		
Flash ROM Write Count		Max. 100000 times		
External Wiring Connection System		40-pin connector		
Applicable Wire Size		0.3mm² (AWG#22) or less (for A6CON1, A6CON4), AWG #24 (for A6CON2)		
Applicable Connector for External Devices		A6CON1, A6CON2, A6CON4 (Sold separately)		
Max. Output Pulse		QD75P1,QD75P2,QD75P4:200kpps; QD75D1,QD75D2,QD75D4:1Mpps		
Max. Connection Distance Between Servos		QD75P1,QD75P2,QD75P4:2m; QD75D1,QD75D2,QD75D4:10m		
Online Module Change		Disabled		
Multiple CPU System		Compatible (*3)		
Number of Occupied I/O Points		32 points/slot (I/O assignment: intelligent)		
5VDC Internal Current Consumption		QD75P1:0.40A QD75D1:0.52A	QD75P2:0.46A QD75D2:0.56A	QD75P4:0.58A QD75D4:0.82A
Weight kg		0.15	0.15	0.16
Dimensions (Wx H x D) mm (inch)		98 x 27.4 x 90 (3.86 x 1.08 x 3.54)		

Notes:
1. QD75P represents the open-collector output system, and QD75D represents the differential driver output system.
2. In speed-position switching control (ABS mode), the control unit available is "degree" only.
3. Corresponding to the function version B or later.

MELSEC Q Series / iQ Basic Positioning Control Modules

For applications not requiring the level of sophistication offered by our QD75P/D/M modules, consider the QD70P4 & P8 modules. These modules offer four and eight axis control from a single module. All basic motion control capabilities for non-coordinated axes are offered.



Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-PT plug in)
- GX Configurator-PT reduces maintenance time with clear presentation of module status
- Multiple axes controlled by a single module to minimize slot occupancy on the rack
- Multiple modules may be installed on a Q Series rack, giving control over dozens of axes
- Start 8 axes simultaneously, with very short (0.1ms) delay
- Variety of axis control schemes (point to point, speed/position switching control)

Required Manuals

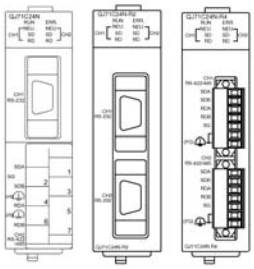
Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080171	QD70 Positioning Module User's Manual	Covers QD70P4, QD70P8 & GX Configurator-PT	Included with GX Configurator PT as PDF	–
IB(NA)0800169	QD70P User's Manual (Hardware)	Basic information on QD70P4 & QD70P8	Supplied with QD70P4 & P8	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Basic Motion Control Modules

Model Number		QD70P4	QD70P8
Stocked Item		S	S
Certification		UL • cUL • CE	UL • cUL • CE
No. of Control Axes		4 axes	8 axes
Interpolation Function		No	
Control Method		PTP (Point To Point) control, path control (linear only), speed-position switching control	
Control Unit		Pulse	
Positioning Data		10 points of data (positioning data No. 1 to 10)/axis (can be set using GX Configurator-PT or sequence program)	
Data Backup		No	
Positioning Control	Positioning Control Method	PTP control : Incremental system/absolute system Speed-position switching control : Incremental system Path control : Incremental system/absolute system	
	Positioning Control Range	**Absolute system:** -2147483648 to 2147483647 (pulse) **Incremental system:** -2147483648 to 2147483647 (pulse) **Speed-position switching control:** 0 to 2147483647 (pulse)	
	Speed Command	0 to 200000 (pulse/s)	
	Acceleration/ Deceleration Processing	Trapezoidal acceleration/deceleration	
	Accel./Decel. Time	0 to 32767 (ms)	
External Device Connection Connector		A6CON1, A6CON2 (option), A6CON4	
Applicable Wire Size		0.3mm² (for use of A6CON1 or A6CON4), AWG#24 (for use of A6CON2)	
Pulse Output Method		Open collector output	
Max. Output Pulse		200kpps	
Max. Connection Distance Between QD70 and Drive Unit		2m (6.56 feet)	
Internal Current Consumption (5 VDC)		0.55A	0.74A
External 24V Current Consumption (24VDC)		0.065A	0.12A
No. of Occupied I/O Points		32 points (I/O assignment: Intelligent function module 32 points)	
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (10.8 x 3.86 x 3.55)	
Weight (kg)		0.15	0.17

MELSEC Q Series / iQ Serial Communication Modules



Serial communication modules provide a way to link the Q Series system to third party systems that offer standard serial RS232 or RS422/485 communication ports. Examples of typical connections include modems, scales, bar code readers, printers and marquee displays. The modules can be regarded as communication co-processors, as they support a variety of dedicated communication functions that are accessed via special CPU instructions. These functions reduce the amount of specialist communications programming required.

Key Features:

- Module set-up via menus in GX-Developer; no programming required (requires use of GX Configurator-SC plug in)
- GX Configurator-SC reduces maintenance time with clear presentation of module status
- Protocol function block allows complex communication protocols to be configured without any programming. Library of preset function blocks available to communicate with third party devices
- Debugging function allows communication signals to be monitored and packet data to be examined
- 230,400 bps communication speed; run both serial ports on the module at 115,200 bps simultaneously
- Use as a duplicate CPU programming port (offers full CPU port capabilities, including program upload/download, device monitoring, etc)
- Use preset MC (MELSEC Communications) or user defined protocols
- Two communications ports per module, each operable independently
- Remote system management & maintenance via third party modems
- Multi-drop communications between multiple systems via RS422/485 ports
- Available with two RS232 ports, or RS232 + RS422/485 ports

Note: *The Q Series Ethernet communication modules (QJ71E71, QJ71E71-B2 & QJ71E71-100) also use the MC protocol.*

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800008	Serial Communication Module User's Manual (Hardware)	Basic information on QJ71C24N & QJ71C24N-R2 modules	Supplied with QJ71C24N & QJ71C24N-R2	–
SH(NA)080006	Q Corresponding Serial Communication Module User's Manual (Basic)	Covers basic programming information for QJ71C24N, QJ71C24N-R2 & GX Configurator-SC	Included with GX Configurator-SC as PDF	–
SH(NA)080007	Q Corresponding Serial Communication Module User's Manual (Application)	Covers using the QJ71C24N & QJ71C24N-R2 module in various practical applications	No (purchase separately)	–
SH(NA)080008	Q Corresponding MELSEC Communication Protocol Reference Manual	Reference guide to the MC Protocol used by the QJ71C24N & QJ71C24N-R2 (and also used by Q Series Ethernet modules)	No (purchase separately)	–
SH(NA)080393	GX Configurator-SC Version 2 Operating Manual	Guide to using the GX-Configurator-SC utility software	Included with GX-Configurator-SC	–

Serial Communication Modules

Model Number		QJ71C24N	QJ71C24N-R2	QJ71C24N-R4
Stocked Item		S	S	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Interface	CH1	RS-232-compliance (D-sub 9P)	RS-232-compliance (D-sub 9P)	RS-422/485-compliance (2-piece plug-in connector socket block)
	CH2	RS-422/485-compliance (2-piece terminal block)	RS-232-compliance (D-sub 9P)	RS-422/485-compliance (2-piece plug-in connector socket block)
Communication Method		Full duplex communication/half duplex communication		
Synchronization Method		Start-up synchronization method		
Transmission Speed		50 / 300 / 600 / 1200 / 2400 / 4800 / 9600 / 14400 / 19200 / 28800 / 38400 / 57600 / 115200 / 230400 • Transmission speed 230400 bps is available for only CH1. (Not available for CH2) • Total transmission speed of two interfaces is available up to 230400 bps. • Transmission speed of up to 115200 bps for each interface is available when two interface are used simultaneously.		
Data Format	Start Bit	1		
	Data Bit	7/8		
	Parity Bit	1 (vertical parity) or none		
	Stop Bit	1/2		
Access Cycle	MC Protocol Communication	Processes one request during installed PLC CPU END processing. Number of scans that must be processed/number of link scans depends on the contents of the request.		
	Nonprocedural Protocol Communication Bidirectional Protocol Communication	Sends each time a send request is issued. Can receive at any time.		
Error Detection	Parity Check	For all protocol, select odd/even by the parameter when there is an error.		
	Sum Check Code	Select by the parameter for MC protocol/Bidirectional protocol. Select by the user frame for non-procedure protocol.		
Transmission Control		RS-232 / RS-422/485 DTR/DSR (ER/DR) control: ○ / X RS/CS control: ○ / X CD signal control: ○ / X DC1/DC3 (Xon/Xoff) control, DC2/DC4 control: ○ / ○ • DTR/DSR signal control and DC code control are selected by the user.		
Line Configuration	RS-232	1:1	1:1	—
	RS-422/485	1:1, 1:n, n:1, m:n	—	1:1, 1:n, n:1, m:n
Max. Transmission Distance (Overall Distance)	RS-232	15 m (49.2 ft.)	15 m (49.2 ft.)	—
	RS-422/485	1200 m (4592.4 ft.) (overall distance)	—	1200 m (4592.4 ft.) (overall distance)
Max. Number of Writes for Flash ROM		100,000 writes to the same area		
Number of Occupied I/O Points		32 points per slot (I/O assignment: Intelli: 32 points)		
Recommended Cable	RS-232	7/0. 127 nP HRV-SV Outside diameter 8.5mm (0.33 in.) or more (Oki Electric Cable Co., Ltd. n:number of pairs)		
	RS-422/485 (*1)	SPEV (SB)-MPC-0.2 x 3P Outside diameter approx. 6.5mm (0.26 in.) (Mitsubishi Cable Industries, LTD.) SPEV(SB)-0.2 x 3P Outside diameter approx. 7.5mm (0.3 in.) (Mitsubishi Cable Industries, LTD.)		
Applicable Connector for External Wiring		9 pin D-sub (male) screw type		—
5VDC Internal Current Consumption		0.31A	0.26A	0.39A
External Dimensions (W x H x D) mm (in)		98 x 27.4 x 90 (3.86 x 1.08 x 3.54)		
Weight kg (lbs)		0.20 (0.44)		

Note:
1. Recommended cables SPEV (SB)-MPC-0.2 x 3P and SPEV (SB)-0.2 x 3P have the same electrical characteristics, but their external dimensions and internal wire colors are different.

Compatible Modem Specifications

Telephone Line	Public Line/Private Line/Cellular Phone	ISDN
Connection Line	Analog 2-wire type	ISDN line
Initialization	Hayes AT command-compatible product	Hayes AT command-compatible product
Communication Standard	V.34/V.32bis/V.32/V.22bis/V.22/V.21V.fc, 212A/103	V.110 (B-channel circuit exchange, D-channel packet switching)
Error Correction	Class 4, class 10 compatible, V.42 compatible	
Data compression	Class 5 compatible, V.42bis compatible	
Others	Should be able to exercise flow control (RS/CS control) and have independent control of DR (DSR) signal.	

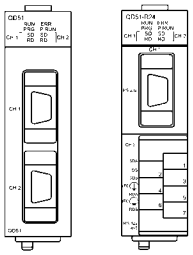
* When using a cellular phone, it is recommended to use a modem whose error correction function supports MNP class 10.
Note that communications may not be made depending on the line status.

MELSEC Q Series / iQ Intelligent Communication Modules

The modules offer a higher-level alternative to the QJ71C24 & QJ71C24-R2. The QD51 & QD51-R24 can run their own BASIC programs, allowing complex communications based tasks to be handled separately of the other CPUs on a Q Series system.

Key Features:

- Runs AD51H-BASIC
- Can run two tasks simultaneously
- Can use external hard disks of connected peripherals
- Range of communications options supported



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800130	QD51/QD51-R24 Corresponding Intelligent Communications Module User's Manual (Hardware)	Basic information on QD51 & QD51-R24	Supplied with QD51 & QD51-R24	–
SH(NA)080089	Q Corresponding Intelligent Communication Module User's Manual	Covers the QD51 & QD51-R24	No (purchase separately)	–
SH(NA)080090	AD51H-BASIC Programming Manual (Command Manual)	Covers AD51H-BASIC commands	No (purchase separately)	–
SH(NA)080091	AD51H-BASIC Programming Manual (Program Manual, Compilation Manual)	Covers debugging, multi-tasking & compilation features of AD51H-BASIC	No (purchase separately)	–

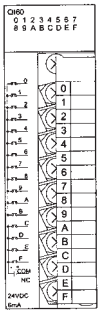
Note: Many of these manuals are available by free download from our website, www.meau.com

Intelligent Communication Modules

Model Number	QD51	QD51-R24
Stocked Item	–	–
Programming Language	AD51H-BASIC	
Certification	UL • cUL • CE	
Number of Tasks	2	
Task Activation Condition	At power-on, activated by PLC CPU, activated by other task	
Internal Memory	Program memory: 64k bytes/2 tasks (Capacity of task 1 + capacity of task 2 ≤ 64k bytes) Common memory: 8k bytes, Buffer memory: 6k bytes, Expanded register: 1024 points (2k bytes), Expanded relay: 1024 points	
I/O To / From PLC CPU	Input 26 points, output 23 points	
Memory Protection	Yes, (Flash ROM write protectable)	
Communication Port	QD51 : RS-232 2ch; QD51-R24 : RS-232 1ch, RS-422/485 1ch	
Communication System	Full-duplex	
Synchronization System	Synchronous	
Transmission Speed (bps)	300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400 Usable when the total transmission speed of two channels is within 38400bps.	
Data Format	Start bit: 1; Data bit: 7 or 8; Parity bit: Even, odd, none; Stop bit: 1 or 2	
Transmission Control	DTR/DSR (ER/DR) control: Available for RS-232 only; RS/CS control: Available for RS-232 only CD signal control: No; DC1/DC3 (Xon/Xoff) control: Yes; DC2/DC4 control: No	
Clock Function	No	
Power Failure Compensation	No	
Storage of User Program onto ROM	No (only program area data is stored onto flash ROM)	
Console	IBM PC/AT personal computer	
Multi-Task Debugging	Possible (using debugger)	
Line Configuration	RS-232 : 1 : 1; RS-422/485 : 1 : 1, 1 : n, n : 1, m : n	
Transmission Distance	RS-232: Max. 15m (49.18 ft.); RS-422/485: Max. 1200m (3934.43 ft.) (overall distance)	
Mountable Station	Q series CPU (Q mode)	
Number of Loadable Modules Per CPU	Max. 64 modules (mountable within I/O modules per CPU)	
Number of Occupied I/O Points	32 points (1 slot occupied) (I/O assignment: Intelligent)	
Internal Current Consumption (5VDC) (A)	QD51: 0.26; QD51-R24: 0.31	
Weight (kg)	0.2	
Dimensions (W x H x D) mm (in)	27.4 x 98 x 90.5 (1.08 x 3.86 x 3.56)	

MELSEC Q Series / iQ Interrupt Modules

Although Q Series I/O modules are designed to offer very fast responses to input signals, some applications need a shorter response than these modules can offer. In these cases, use the QI60 interrupt module. This offers response times as rapid as 50 microseconds for very fast event capture. For more sophisticated applications, the QD60P8-G offers isolated input capability together with averaging, scaling and sampling functions.



Key Features:

- 16 input points
- Response time adjustable over the range 0.05ms to 1ms
- 24 VDC positive common connection

Required manuals:

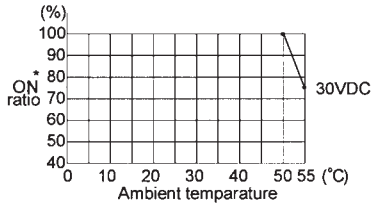
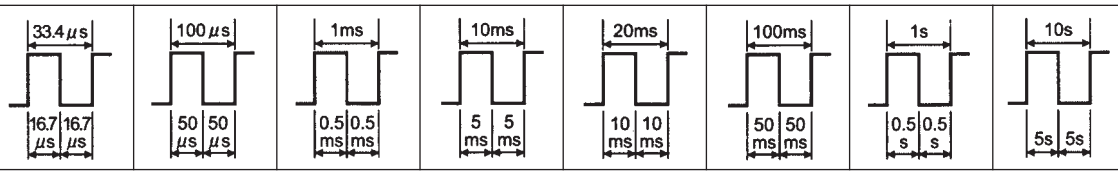
The QI60 is covered in the Q Series CPU manuals.

Interrupt Module

Model Number			QI60				
Stocked Item			S				
Certification			UL • cUL • CE				
Number of Input Points			16 points				
Isolation Method			Photocoupler				
Rated Input Voltage			24 VDC (+20/-15%, ripple ratio within 5%)				
Rated Input Current			Approx. 6mA				
Input Derating			No				
ON Voltage/ON Current			19V or higher/3mA or higher				
OFF Voltage/OFF Current			11V or lower/1.7mA or lower				
Input Resistance			Approx. 3.9kΩ				
Response Time (ms)	Set Value (*)		0.1	0.2	0.4	0.6	1
	ON—OFF	Typ	0.05	0.15	0.30	0.55	1.05
		Max	0.10	0.20	0.40	0.60	1.20
	OFF—ON	Typ	0.15	0.20	0.35	0.60	1.10
		Max	0.20	0.30	0.50	0.70	1.30
Dielectric Withstand Voltage			560 VAC rms/3 cycles (altitude 2000m (6557.38 feet)				
Insulation Resistance			10MΩ or more by insulation resistance tester				
Noise Immunity			By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency Fast transient noise IEC61000-4-4: 1kV				
Common Terminal Arrangement			16 points/common (common terminal: TB17)				
Number of Occupied I/O Points			16 points (I/O allocation is set as 16-point intelligent module)				
Operation Indicator			ON indication (LED)				
External Connections			18-point terminal block (M3 x 6 screws)				
Applicable Wire Size			Core: 0.3 to 0.75mm^2 (OD: 2.8mm (0.11 inch) or less)				
Applicable Crimping Terminal			R1.25-3 (sleeved crimping terminals cannot be used)				
5 VDC Internal Current Consumption (mA)			60 (TYP. all points ON)				
Weight (kg)			0.20				
Dimensions (W x H x D) mm (in)			27.4 x 98 x 90 (1.08 x 3.86 x 3.54)				

Note: Set via GX-Developer

Isolated Interrupt Module

Model Number		QD60P8-G							
Stocked Item		S							
Certification		CE							
Counting Speed Switch Settings		30kpps	10kpps	1kpps	100pps	50pps	10pps	1pps	0.1pps
Number of I/O Occupied Points		32 points (I/O assignment: 32 points for intelligent function module)							
Number of Channels		8 channels							
Count Input Signal	Phase	1-phase input							
	Signal Level	5VDC / 12 to 24VDC							
Input Derating		 * "ON" indicates the status where voltage is applied to pulse input terminals.							
Counter	Counting Speed (Max.)	30kpps	10kpps	1kpps	100pps	50pps	10pps	1pps	0.1pps
	Counting Range	Sampling pulse number: 16-bits binary values (0 to 32767) Accumulating count value: 32-bits binary values (0 to 99999999) Input pulse value: 32-bits binary values (0 to 2147483647)							
	Count Type	Linear counter method, Ring counter method							
	Minimum Count Pulse Width (Duty Ratio 50%)								
Withstand Voltage		For 1 min at 1500 VAC between AC external connecting terminals and general grounding For 1 min at 500 VAC between DC external connecting terminals and general grounding For 1 min at 1780 VAC between channels							
Insulation Resistance		5 MΩ or more at 500 VDC between AC external connecting terminals and general grounding							
Connected Terminal		18 points terminal block							
Applicable Wire Size		0.3 to 0.75 mm²							
Applicable Solderless Terminals		R1.25-3 (A solderless terminals with sleeves cannot be used)							
Internal Current Consumption (5VDC)		0.58A							
Weight		0.17 kg							
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.54)							

* Counting speed is affected by pulse rise and fall time. Note that if a pulse that has a large rise and/or fall time is counted, a miscount may occur.

Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080313	Channel Isolated Pulse Input Module (QD60P8-G) User's Manual	Covers QD60P8-G	Supplied as a PDF with GX Configurator-CT	–
IB(NA)0800229	Channel Isolated Pulse Input Module User's Manual (Hardware) QD60P8-G	Basic information on QD60P8-G	Yes	–

MELSEC Q Series Slot Filler Module

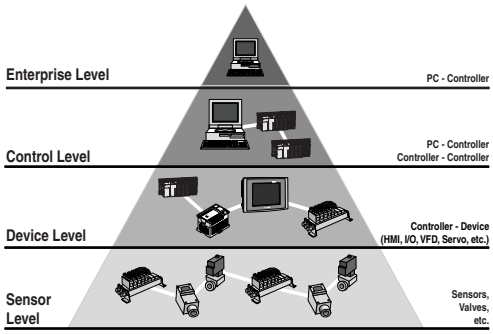
In some cases it is not possible to fill all the slots on a rack. Where unused slots exist, there is a risk of system damage caused by extraneous material entering the backplane or system modules via the unused slot positions. The QG60 module is an empty single slot module case that fits in an unused slot to protect from possible contamination. Since the QG60 contains no electronic components, it does not affect the system configuration, power consumption or programming.

Overview of Networks

When choosing a network solution a number of criteria may come into play. Topology, bus speed, communications distance, redundancy, data transfer capabilities, the number of nodes the network can support, deterministic capabilities, cost, ease-of-use, third party support to name just a few.

But most importantly, will it work well within your specific application? When developing our family of network products, we've taken all these factors into consideration — assuring users, all the necessary features and capabilities are packaged into the network product they have selected.

From top to bottom in the network hierarchy, from open architecture protocols to seamless engineered systems, from sensor to enterprise level, we offer a host of powerful network solutions for users to choose from. The one common denominator with all Mitsubishi Electric network products is unmatched performance. In relative performance data comparisons, all our network solutions meet, exceed or dramatically outperform most competitive networks available on the global market today.



While bus speed is a critical factor in measuring performance, there are several other reasons why Mitsubishi Electric network solutions excel over others. Easy connectivity, seamless integration, synergistic performance characteristics of a Mitsubishi Electric controlled network and above all else — maximum levels of uptime without sacrificing performance or productivity. Whether you have an entire factory floor or just an individual machine to network, you'll find Mitsubishi Electric's expansive range of network options to be the superior choice.

Enterprise Level

Specifications	Ethernet (100base-TX)	Ethernet (10base-T)	Ethernet (10base-5)	Ethernet (10base-2)
Network Level	Enterprise	Enterprise	Enterprise	Enterprise
Architecture	Star (via hub)	Star (via hub)	Bus	Bus
Communications Media	Cat. 5 (UTP/STP)	Cat. 5 (UTP/STP)	via AUI transceiver	Coax
Transmission Speed	100Mbit/s	10Mbit/s	10Mbit/s	10Mbit/s
Number of Stations	Two levels of cascade connections via hubs	Four levels of cascade connections via hubs	100/segment	30/segment
Maximum Distance (m)	100/segment	100/segment	500/segment	185/segment
Master Module	N/A	N/A	N/A	N/A
Remote I/O	N/A	N/A	N/A	N/A

Control Level

Specifications	CC-Link IE	MELSECNET/H
Network Level	Control	Control
Architecture	Loop	Bus/Loop
Communications Media	Fiber	Fiber/Coax
Transmission Speed	1000Mbit/s	10/25Mbit/s (depends on module used)
Number of Stations	120	64 (fiber)/32 (coax)
Maximum Distance (m)	66,000	30,000 (fiber)/500 (coax)
Master Module	Yes (and local)	Yes (and local)
Remote I/O	No	Yes

Note: MELSECNET/H is backwards compatible with MELSECNET/10. CC-Link IE was formerly known as MELSECNET/G.

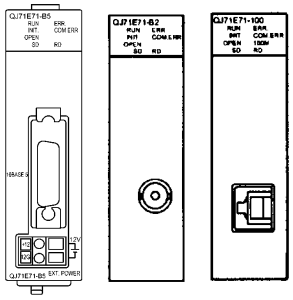
Device Level

Specifications	CC-Link	DeviceNet	PROFIBUS-DP	MODBUS/TCP	MODBUS/RTU
Network Level	Device	Device	Device	Device	Device
Architecture	Bus	Bus	Bus	Star (via hub)	Bus
Communications Media	STP	Thick/thin trunkline	STP	Cat. 5 (UTP/STP)	STP
Transmission Speed	10Mbit/s (all devices)	0.5Mbit/s	12Mbit/s (depends on devices used)	100Mbit/s	115kbps
Number of Stations	64	64	60	64	64
Maximum Distance (m)	1200/segment (extend up to 13.2km with repeaters)	500	1200	100	1200
Master Module	Yes (and local)	Yes (and slave)	Yes	Yes (and slave)	Yes (and slave)
Remote I/O	Yes	Yes	Yes	Yes	Yes

Sensor Level

Specifications	CC-Link/LT	AS-i
Network Level	Sensor	Sensor
Architecture	Bus	Star, bus or tree
Communications Media	Dedicated mechanically keyed cable	
Transmission Speed	2.5Mbt/s	172kbit/s
Number of Stations	64	31
Maximum Distance (m)	700	100
Master Module	Yes	Yes
Remote I/O	Yes	Yes

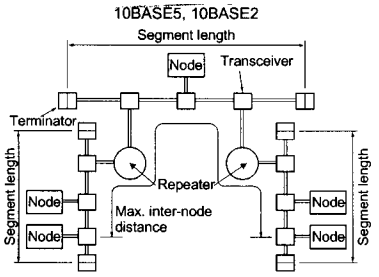
MELSEC Q Series / iQ Ethernet Enterprise Level Network Modules

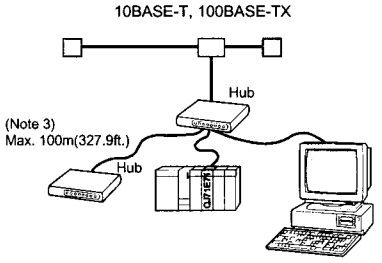


Typically Ethernet is used to link shop-floor systems to higher level IT systems for SCADA (Supervisory Control And Data Acquisition) monitoring, maintenance, and similar functions. The Q Series Ethernet modules provide a method of linking automation systems to existing standard LAN infrastructures throughout a plant.

Key Features:

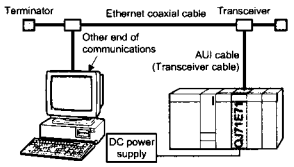
- GX-Developer provides complete support for configuration and maintenance of Ethernet links (no need for accessory plug-in modules)
- Programming, monitoring, email & FTP capabilities for remote system monitoring & maintenance via Ethernet connection
- Compatible with existing LANs via range of physical connection formats (10base-T, 100base-TX, 10base-5, 10base-2)
- Peer-to-peer communication
- Multiple ports
- Acts as a gateway into lower level networks for access to individual stations on large networks
- "Keep Alive" function allows the status of external equipment to be monitored via TCP/IP



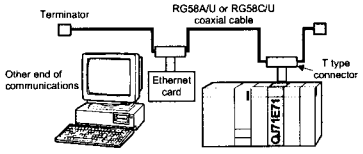


The following equipment is required for configuring an Ethernet system.

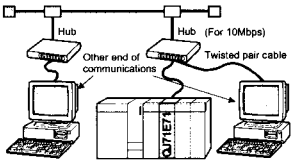
■ 10BASE-5 : QJ71E71-B5



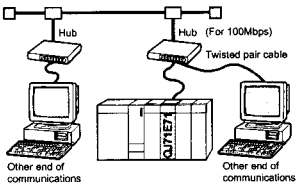
■ 10BASE-2 : QJ71E71-B2



■ 10BASE-T : QJ71E71-100



■ 100BASE-TX : QJ71E71-100



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800009	Ethernet Interface Module User's Manual (Hardware) QJ71E71-100, QJ71E71, QJ71E71-B2	Basic information on QJ71E71-100, QJ71E71 & QJ71E71-B2	Yes	–
SH(NA)080009	Q Corresponding Ethernet Interface Module User's Manual (Basic)	Covers programming and using the Ethernet modules	No (purchase separately)	–
SH(NA)080010	Q Corresponding Ethernet Interface Module User's Manual (Application)	Covers higher level functions, such as email, FTP, and integration with other networks	No (purchase separately)	–
SH(NA)080008	Q Corresponding MELSEC Communication Protocol Reference Manual	Reference guide to the MC Protocol used by the Q Series Ethernet modules (Also used by the QJ71C24 & QJ71C24-R2)	No (purchase separately)	–
SH(NA)080180	Manual (Web Function) Q Corresponding Ethernet Interface Module User's	Guide to using the Ethernet modules with an Internet connection	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Ethernet Enterprise Level Network Modules

Model Number			QJ71E71-100		QJ71E71-B5	QJ71E71-B2
			100BASE-TX	10BASE-T	10BASE5	10BASE2
Stocked Item			S		–	–
Certification			UL • cUL • CE		UL • cUL • CE	UL • cUL • CE
Transmission Specifications	Data Transmission Speed		100Mbps	10Mbps		
	Communication Mode		Full-duplex/Half-duplex	Half-duplex		
	Transmission Method		Base band			
	Maximum Node-to-Node Distance		—		2500 m (8202.10 ft.)	925 m (3034.77 ft.)
	Maximum Segment Length		100 m (328.08 ft.) (*1)		500 m (1640.42 ft.)	185 m (606.96 ft.)
	Maximum Number of Modes/Connection		Cascade connection Maximum 2 stages	Cascade connection Maximum 4 stages	100 units/ segment	30 units/ segment
	Interval Between the Minimum Nodes		—		2.5 m (8.20 ft.)	0.5 m (1.64 ft.)
Transmission Data Storage Memory	No. of Simultaneously Open Connections Allowed		16 connections (Connections usable by the sequence program)			
	Fixed Buffer		1 k words x 16			
	Random Access Buffer		6 k words x 1			
	E-mail	Attached File	6 k words x 1			
		Main Text	960 words x 1			
Number of Occupied I/O Points			32 points/1 slot (I/O assignments: intelligent)			
5VDC Internal Current Consumption			0.50A		0.50A	0.60A (*3)
12VDC External Power Supply Capacity (Transceiver)			—		(*2)	—
External Dimensions (H x W x D) mm (in)			98 x 27.4 x 90 (3.86 x 1.08 x 3.54)			
Weight kg (lb)			0.11 (0.24)		0.12 (0.26)	0.13 (0.29) (*3)

Notes:
1. Length between the Hub and node.
2. It is necessary to apply a transceiver, or a device that meets AUI cable specifications.
3. The product with first 5 digits of serial number "05049" or earlier is different as follows:
- 5VDC internal current consumption: 0.70A
- Weight: 0.14kg (0.31lb.)

Email Specifications

Data Size	Attached File	6k words x 1
	Main Text	960 words x 1
Data Transfer Method		When Sending : Either an attached file or text is sent. (Selectable) When Receiving: Attached file is received.
Subject		US-ASCII format or ISO-2022-JP (Base 64)
Attached File Format		MIME format
MIME		Version 1.0
Data Format of Attached File		Binary, ASCII or CSV can be selected. File name: XXXX.bin (binary), XXXX.asc (ASCII), XXXX.csv (CSV) (CSV: Comma Separated Value)
Division of Attached File		Cannot be divided (only one file can be sent/received) *When divided files are received, the first file portion is received and the others are discarded.
Send (Encode)		Subject: Base 64/7bits • Main Text: 7 bits Attached file: Base 64
Receive (Decode)		Subject : (Not decoded) Text : (Unreceivable) Attached file encoding: Base 64/7 bits/8 bits/Quoted Printable
Encryption		No
Compression		No
Communications with the Mail Server		SMTP (sending server) port number = 25 POP3 (receiving server) port number = 110

MELSEC Q Series / iQ CC-Link IE Control Level Master/Local Network Modules

CC-Link IE is an industry leading alternative for open control level networking. Originally introduced as MELSECNET/G, it introduces an unprecedented 1Gbit/s Ethernet physical layer fiber topology for system performance surpassing any other network technology. MELSECNET/G has been turned over to the open administration of the CC-Link Partner Association (CLPA), and is now known as CC-Link IE. Mitsubishi offers full support for CC-Link IE via the Q Series Automation Platform and the iQ Platform system.

Key features:

- Practically unlimited bandwidth (1Gbit/s)
- Noise immune, fault tolerant dual loop optical fiber media
- Uses industry standard 1000base-SX optical fiber and LC type connectors
- Variety of Reliability, Availability & Serviceability (RAS) functions to allow network operation to continue despite broken media, power failures, etc
- Extensive diagnostic functions and tools to monitor network operation and quickly troubleshoot faults
- Up to 120 stations per network
- Up 550 meters between stations
- Connect up to 239 networks
- Program free parameter based configuration for cyclic communications

CC-Link IE

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800364E	CC-Link IE Network Module User's Manual (Hardware)	Basic information on QJ71GP21-SX & QJ71GP21S-SX	Yes	–
SH(NA)080668ENG	CC-Link IE Network System Reference Manual (Controller Network)	Reference guide to the CC-Link IE network technology	No (purchase separately)	–

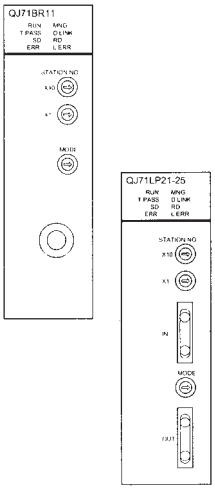
Note: Many of these manuals are available by free download from our website, www.meau.com.

CC-Link IE Optical Fiber Cordsets

Model Number	Description	Stocked Item
QG-□M-B-LL	CC-Link IE cordset, where □ represents length 1, 2, 3, 5, 10, 15, 20, 25, 30, 35, 40 or 50 meters	S

Model Number		QJ71GP21-SX	QJ71GP21S-SX
Stocked Item		S	–
Certification		UL • cUL • CE	
Max. Link Points Per Network	LB	32K points (32768 points, 4KB)	
	LW	128K points (131072 points, 256KB)	
	LX	8K points (8192 points, 1KB)	
	LY	8K points (8192 points, 1KB)	
Max. Link Points Per Station	LB	16K points (16384 points, 2KB)	
	LW	16K points (16384 points, 32KB)	
	LX	8K points (8192 points, 1KB)	
	LY	8K points (8192 points, 1KB)	
Transient Transmission Capacity		Up to 1920 bytes	
Communication Speed		1Gbps	
Number Of Stations Per Network		When Universal model QCPU is used for control station: 120; (Control station: 1, Normal station: 119) When High Performance model QCPU is used for control station: 64 (Control station: 1, Normal station: 63)	
Connection Cable		Optical fiber cable (Multi-mode fiber)	
Overall Cable Distance		66000m (When 120 stations are connected)	
Station-To-Station Distance (Max.)		550m (Core/Clad = 50/125 (μm))	
Max. Number Of Networks		239	
Max. Number Of Groups		32	
Number Of Occupied I/O Points		32 (Intelli.: 32 points)	48 (I/O assignment: Empty first half: 16 points, Latter half: 32 points for intelli.)
External Power Supply	Voltage	No external power supply function	20.4V to 31.2VDC
	Current		0.28A
	Terminal Screw Size		M3
	Applicable Solderless Terminal		R1.25-3
	Applicable Wire Size		0.3 to 1.25mm²
	Tightening Torque		0.42 to 0.58N•m
	Allowable Momentary Power Failure Time		1ms (Level PS1)
	Noise Immunity		By noise simulator of 500Vp-p noise voltage, 1μs noise width, and 25 to 60Hz noise frequency
Internal Current Consumption (5VDC)		0.85A	0.90A
Dimensions (H x W x D) mm		98 x 27.4 x 90	98 x 55.2 x 90
Weight (kg)		0.18	0.28

MELSEC Q Series / iQ MELSECNET/H Control Level Master/Local Network Modules



Use MELSECNET/H to link Q Series systems together on a control level network for the coordinated operation of multiple controllers on a production line or large machine. MELSECNET/H also supports the direct connection of PCs onto the network for SCADA or maintenance applications. MELSECNET/H was designed to offer similar performance benefits to most industrial Ethernet systems, while offering the high degree of performance required in an automation environment.

Key Features:

- MELSECNET/H configuration and maintenance is supported by GX Developer with no need for accessory plug-ins
- High-speed communications at up to 25Mbit/s (depending on modules used)
- Backwards compatible with existing MELSECNET/10 installations.
- Guaranteed determinism via token passing scheme
- Scalable to exceed the needs of the largest installations (over 15,000 stations in one system)
- Up to 30km loop circumference via fiber connections
- Loop topology optical fiber media offers maximum speed and dual redundancy
- Single bus coax offers many performance benefits with economical media
- No programming required to establish cyclic network communications; just set parameters in GX-Developer
- Transient communications permit asynchronous peer to peer messaging
- Loop topology offers recovery from media breaks via automatic loop back
- Floating master maintains network operation by allowing any station to take over after the original master goes offline
- Offline stations return to the network automatically when able to
- Extensive diagnostic functions to monitor network operation and status
- Program & monitor across the network
- Transmit up to 35 kbytes of uninterrupted data for increased performance and simpler programming (S/N 06092x, Version D units or later)

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800144	MELSECNET/H Network Module User's Manual (Hardware) QJ71LP21-25, QJ71LP21G, QJ71BR11	Basic information on QJ71LP21-25, QJ71LP21G & QJ71BR11 (MELSECNET/H master modules)	Yes	–
SH(NA)080049	MELSECNET/10H for Q Network System Reference Manual (PLC to PLC network)	General reference to MELSECNET/H (MELSECNET/H & MELSECNET/10H are equivalent terms)	No (purchase separately)	–

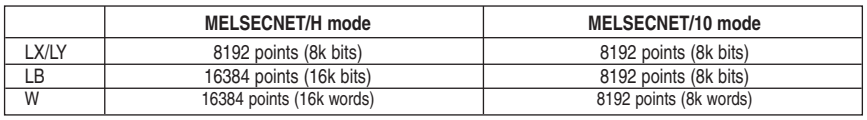
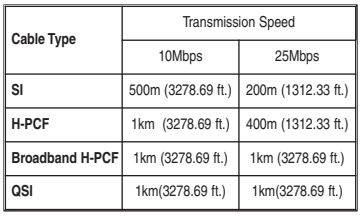
Note: Many of these manuals are available by free download from our website, www.meau.com

MELSECNET/H Optical Fiber

Optical fiber media cable is available for connecting MELSECNET/H networks.

Model Number	Description	Stocked Item
AS-1000M-B	Optical fiber cable, sold by the meter	S
DL-72ME	AS-1000M-B connector, MEAU offers the service to provide pre-terminated cables as required	S
PA7003	Splice connector for joining pre-terminated AS-1000M-B cable	–
CAK-0068ME	Optional termination tool kit for AS-1000M-B and DL-72ME for on-site termination work	–

MELSECNET/H Control Level Master/Local Network Modules

Model Number		QJ71LP21-25	QJ71LP21S-25	QJ71LP21G	QJ71LP21GE	QJ71BR11
Stocked Item		S	–	–	–	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Connection Form		Duplex loop type				Simplex bus type
Max. Number of Link Points Per Network						
Max. Number of Link Points Per Station		[LW+LB+LY<=2000 bytes (cyclic communication)]+[LW+LB+LY<=2000 bytes (low-speed cyclic communication)]				
Transient Transmission Capacity		Max. 1920 bytes/frame				
Transmission Speed		10Mbps/25Mbps (depending on switch setting) (*1)		10Mbps	10Mbps	10Mbps
Communication System		Token passing				
Synchronization		Flag synchronization (frame synchronization system)				
Modulation System		Base band system				
Transmission Code		NRZI (Non Return to Zero Inverted)				
Cable Type		Optical (AS-1000M-B (SI, 200/250)) (*2)	Optical (AS-1000M-B (SI, 200/250)) (*2)	Optical (GI-50/125)	Optical (GI-62.5/125)	Coaxial 75Ω RG-59B/U RG-11A/U
Transmission Frame Format		HDLC conformance (frame format)				
Error Control System		CRC ($X^{16}+X^{12}+X^{5}+1$) and time-out retry				
Max. Number of Networks		239				
Max. Number of Groups		32				
Number of Stations Connected		64 stations (1: control station, 63: normal station)				32 stations (1: control station, 31: normal station)
Overall Distance		30km (98360.67 ft.)				500m (1639.34 ft.) RG-11A/U) / 300m (983.61 ft.) (RG-59B/U)
Station to Station Distance				2km (6557.38 ft.)		500m (1639.34 ft.) (RG-11A/U) / 300m (983.61 ft.) (RG-59B/U)
Distance Extension Repeater		—				Up to 2.5km (8196.72 ft.) by connection of max. four repeaters. Use A6BR10/ A6BR10-DC repeaters.
Number of I/O Points Occupied (*3)		32 points (I/O assignment, 32 intelligent points)	48 points (I/O assignment: first 16 points as empty, 1st 32 points as intelligent)	32 points (I/O assignment, 32 intelligent points)		
External Power Supply	Voltage	—	20.4 to 31.2 VDC	—	—	—
	Current	—	0.20 A	—	—	—
	Terminal Screw Size	—	M3 Screw	—	—	—
	Applicable Solderless Terminal	—	R1.25-3	—	—	—
	Applicable Wire Size	—	0.3 to 1.25 mm^2	—	—	—
	Tightening Torque	—	42 to 58N • cm	—	—	—
Internal Current Consumption (5VDC) (A)		0.55	0.55	0.55	0.55	0.75
Weight (kg)		0.11	0.20	0.11	0.11	0.11
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.54)				

	MELSECNET/H mode	MELSECNET/10 mode
LX/LY	8192 points (8k bits)	8192 points (8k bits)
LB	16384 points (16k bits)	8192 points (8k bits)
W	16384 points (16k words)	8192 points (8k words)

Cable Type	Transmission Speed	
	10Mbps	25Mbps
SI	500m (3278.69 ft.)	200m (1312.33 ft.)
H-PCF	1km (3278.69 ft.)	400m (1312.33 ft.)
Broadband H-PCF	1km (3278.69 ft.)	1km (3278.69 ft.)
QSI	1km(3278.69 ft.)	1km(3278.69 ft.)

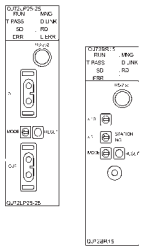
Notes:
1. 25 Mbps is available for the MELSECNET/H mode only.
2. Other types of fiber can be used. See "Station to station distance."
3. QJ71LP21S-25 occupies two slots on a Q Series base or extension unit.

MELSEC Q Series / iQ MELSECNET/H Remote I/O Network Modules

These modules form a complimentary solution to the master/local modules. The master/local modules allow CPUs to be linked for information exchange. The remote I/O modules fit on a base rack in place of the CPU, and allow this rack of I/O to be operated under the control of a remote Q Series CPU over a MELSECNET/H link.

Key Features:

- Fiber loop & coax bus versions available
- Place complex I/O combinations on a remote network link
- Most I/O & special function modules (analog, motion, communications, etc) can be installed on a remote I/O rack
- Remote I/O modules offer a communication port on the I/O rack when local access is required



Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800145	MELSECNET/H Network Module User's Manual (Hardware) QJ72LP25-25, QJ72LP25G	Basic information on QJ72LP25-25, QJ72LP25G, QJ72BR15, QJ72BR15 (MELSECNET/H remote I/O station modules)	Yes	–
SH(NA)080124	Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network)	General reference to MELSECNET/H remote I/O network	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

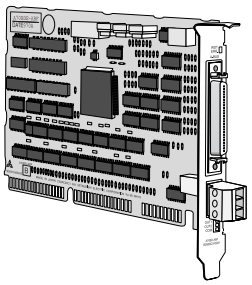
Q Series / iQ MELSECNET/H Remote I/O Network Modules

Mode Number		QJ72LP25-25	QJ72LP25G	QJ72LP25GE	QJ72BR15
Stocked Item		S	–	–	S
Certification		UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE
Connection Form		Duplex loop type			Simplex bus type
Max. Number of Link Points Per Network	LX/LY	8192 points (8k bits)			
	LB	MELSECNET/H mode: 16384 points (16k bits)			
	LW	MELSECNET/H mode: 16384 points (16k words)			
Max. Number of Link Points Per Station		Remote I/O station to remote master station ((LY+LB)/8 + (2 LW)) ≤ 1600 bytes			
Transient Transmission Capacity		Max. 1920 bytes/frame			
Transmission Speed		10Mbps/25Mbps (depending on switch setting)	10Mbps		
Communication System		Token passing system			
Synchronous System		Flag synchronization (frame synchronization system)			
Modulation System		Base band system			
Coding Method		NRZI (Non Return to Zero Inverted)			Manchester
Cable Type		Optical (AS-1000M-B (SI, 200/250) (*1)	Optical (GI-50/125)	Optical (GI-62.5/125)	Coaxial 75Ω (RG-59B/U, RG-11A/U)
Transmission Frame Format		HDLC-compliant (frame format)			
Error Control System		CRC ($X^{16}+X^{12}+X^5+1$) and time-out retry			
Max. Number of Networks		239			
Number of Stations		65 stations (1: remote master station, 1: remote I/O station)			33 stations (1: remote master station, 32: remote I/O station)
Overall Distance		30km (98360.66 ft.)			500m (1639.34 ft.) (RG-11A/U) 300m (983.61 ft.) RG-59B/U
Distance Extension Repeater		—	—	—	Up to 2.5km (8196.72 ft.) 4 repeaters max. Use A6BR10/A6BR10-DC
Interstation Distance	Communication Speed: 10Mbps	SI type optical cable: 500m (3278.69 ft.), H-PCF type optical cable: 1km (3278.69 ft.), Broad-band H-PCF cable: 1km (3278.69ft.), QSI type optical cable: 1km (3278.69 ft.)	2km (6557.38 ft.)	2km (6557.38 ft.)	—
	Communication Speed: 25Mbps	SI type optical cable: 200m (1312.33 ft.), H-PCF type optical cable: 400m (1311.48 ft.), Broad-band H-PCF cable: 1km (3278.69 ft.), QSI type optical cable: 1km (3278.69 ft.)	—	—	—
Number of Occupied I/O Points		—	—	—	—
5VDC Internal Current Consumption (A)		0.89	0.89	0.89	1.1
Weight (kg)		0.15	0.15	0.15	0.16
Dimensions (W x H X D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.54)			

Note: 1. Other types of fiber can be used. See "Interstation distance".

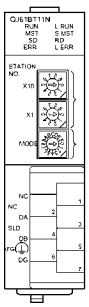
PC Network Cards

Many of our larger scale controller systems are typically integrated into large-scale plant wide networks that require integration with PC based systems. Mitsubishi Electric addresses this requirement with a range of PC compatible network cards that allow a PC to be directly connected to a number of our networks. These boards are typically used as the physical network interface for a PC system written in third party applications such as Microsoft® Visual Basic ™, Visual C++™, etc.



Model Number	Q80BD-J71GP21-SX	Q80BD-J71GP21S-SX	Q80BD-J71LP21-25	Q80BD-J71LP21S-25	Q80BD-J71LP21G	Q80BD-J71LP21GE	Q80BD-J71BR11	Q80BD-J61BT11N
Stocked Item	–	–	S	–	–	–	S	–
Certification	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	UL • cUL • CE	CE	CE	UL • cUL • CE	UL • cUL • CE
Network Type	CC-Link IE	CC-Link IE	MELSECNET/H	MELSECNET/H	MELSECNET/H	MELSECNET/H	MELSECNET/H	CC-Link
Media Type	Optical Fiber (62.5 micron)	Optical Fiber (62.5 micron)	Optical Fiber (200 micron)	Optical Fiber (200 micron)	Optical Fiber (50 micron)	Optical Fiber (62.5 micron)	Coax	Twisted Pair
Configuration Type	Dual loop	Dual loop	Dual loop	Dual loop	Dual loop	Dual loop	Bus	Bus
Station Type	Master/local	Master/local	Master/local	Master/local	Master/local	Master/local	Master/local	Master/local
External Power Supply	No	Yes	No	Yes	No	No	No	No

CC-Link Device Level Master/Local Network Module



Device level networks typically link a controller to the physical components of a system that it controls. CC-Link represents the next level down from MELSECNET/H in the networking hierarchy and allows devices such as I/O modules, VFDs, HMIs and servos to be connected to the controller in a very cost effective, high performance way via a single network cable.

Key Features:

- QJ61BT11N module supports CC-Link V2.0
- V2.0 increases I/O capacity to 8192 points and data capacity to 4096 words (up from 2048 and 512 respectively)
- V2.0 permits more efficient use of network station address space
- CC-Link configuration and maintenance is supported by GX Developer with no need for accessory plug-ins
- Control up to 64 CC-Link networks from a single Q Series system
- Open device network with over 200 vendors
- Eliminates costly wiring harnesses with a single economical cable
- Adds device diagnostic capabilities
- All devices on the network support high performance 10Mbit/s communications speed
- Up to 13.2km bus length with repeaters
- Redundant master station capability
- Fully supported by all Mitsubishi automation products
- Very wide array of products available

Please see the CC-Link part of the Distributed I/O section for a full listing of the CC-Link I/O products available.

Required Manuals

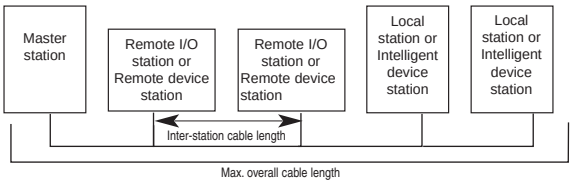
Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800250	CC-Link System Master/Local Module User's Manual (Hardware) QJ61BT11N	Covers basic information on QJ61BT11N	Yes	–
SH(NA)080394	CC-Link System Master/Local Module User's Manual QJ61BT11N	Covers programming a CC-Link system	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

CC-Link Device Level Master/Local Network Module

Model Number	QJ61BT11N
Stocked Item	S
Certification	UL • cUL • CE
Transmission Rate	Can select from 156 kbps/ 625 kbps/ 2.5 Mbps/ 5 Mbps/ 10 Mbps
Maximum Overall Cable Distance (Maximum Transmission Distance)	Varies according to the transmission rate (156 kbps: 1200m; 10Mbps: 100m)
Maximum Number of Connected Stations (Master Station)	64
Number of Occupied Stations (Local Station)	1 to 4 stations; The number of stations can be switched using the GX Developer parameter setting.
Maximum Number of Link Points Per System	Remote I/O (RX, RY): 8192 points; Remote register (RWw): 2048 words (Master station — remote device station/local station/ intelligent device station/standby master station; Remote register (RWr): 2048 words (Remote device station/local station/ intelligent device station/standby master station—master station
Remote Station/Local Station/Intelligent Device Station/Standby Master Station Maximum Number of Link Points Per Station	Remote I/O (RX, RY): 128 points; Remote register (RWw): 32 words (master station — remote device station/ local station/intelligent device station/standby master station); Remote register (RWr): 32 words (remote device station/local station/ intelligent device station/standby master station— master station)
Communication Method	Polling method
Synchronization Method	Flag synchronous method
Encoding Method	NRZI method
Transmission Path	Bus (RS-485)
Transmission Format	Conforms to HDLC
Error Control System	CRC ($X^{16} + X^{12} + X^5 + 1$)
Connection Cable	CC-Link cable BA1SJ61-S or BA1SJ61-P. Use terminating resistors.
RAS Function	Automatic return function; Slave station cut-off function; Error detection by the link special relay/register
Number of I/O Occupied Points	32 points (I/O assignment: Intelligent 32 points)
5VDC Internal Current Consumption	0.46 A

CC-Link Device Level Master/Local Network Module (continued)

<table>
<tr><th colspan="2">Model Number</th><th>QJ61BT11N</th></tr>
<tr><td>Max. Overall Cable Length and Inter-Station Cable Length (Ver. 1.10 or later)</td><td>Same Specifications Regardless of System Configuration</td><td>

Master station
Remote I/O station or Remote device station
Remote I/O station or Remote device station
Local station or Intelligent device station
Local station or Intelligent device station
Inter-station cable length
Max. overall cable length
<table>
<tr><td colspan="3">Ver. 1.10-compatible CC-Link dedicated cable (terminating resistor 110Ω used)</td></tr>
<tr><td>Transmission speed</td><td>Inter-station cable length</td><td>Max. overall cable length</td></tr>
<tr><td>156kbps</td><td rowspan="5">20 cm (7.88 inch) or more</td><td>1200m (3934.43 ft.)</td></tr>
<tr><td>625kbps</td><td>900m (2950.82 ft.)</td></tr>
<tr><td>2.5Mbps</td><td>400m (1311.48 ft.)</td></tr>
<tr><td>5Mbps</td><td>160m (524.59 ft.)</td></tr>
<tr><td>10Mbps</td><td>100m (327.87 ft.)</td></tr>
</table>
</td></tr>
<tr><td colspan="2">Connection Cable</td><td>BA1SJ61-S (signal only) / BA1SJ61-P (signal and power)</td></tr>
<tr><td colspan="2">Number of Occupied I/O Points</td><td>32 points (I/O assignment: 32 intelligent points)</td></tr>
<tr><td colspan="2">Internal Current Consumption (5VDC) (A)</td><td>0.46</td></tr>
<tr><td colspan="2">Dimensions (W x H x D) mm (in)</td><td>27.4 (1.08) x 98 (3.86) x 90 (3.54)</td></tr>
<tr><td colspan="2">Weight (kg)</td><td>0.12</td></tr>
</table>

Required Manuals for Profibus-DP

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800150	QJ71PB92D User's Manual (Hardware)	Covers basic information on QJ71PB92D	Yes	–
SH(NA)080127	Profibus-DP Interface Module User's Manual	Covers programming a Profibus-DP network	Included as PDF with GX Configurator-DP	–
IB(NA)65778	GX Configurator-DP 4.0 configuration system for open networks software manual	Covers the use of GX-Configurator-DP	Included as PDF with GX Configurator-DP	–

MELSEC Q Series Profibus-DP Device Level Network Master Module

The Profibus-DP master module allows the Q Series to control systems that require integration of third party Profibus-DP products.
The QJ71PB92D module is configured by use of the GX Configurator-DP plug-in for GX-Developer.

<table>
<tr><th>Model Number</th><th colspan="2">QJ71PB92D</th></tr>
<tr><td>Stocked Item</td><td colspan="2">S</td></tr>
<tr><td>Certification</td><td colspan="2">UL • cUL • CE</td></tr>
<tr><td>Compatible Network</td><td colspan="2">Profibus-DP</td></tr>
<tr><td>Function</td><td colspan="2">Master</td></tr>
<tr><td rowspan="4">Transmission Speed & Distance</td><td>9.6k/19.2k/93.75k bps</td><td>1,200m (3.937 ft.)</td></tr>
<tr><td>187.5k bps</td><td>1000m (3.280 ft.)</td></tr>
<tr><td>500k bps</td><td>400m (1,312 ft.)</td></tr>
<tr><td>1.5M bps</td><td>200m (656 ft.)</td></tr>
<tr><td></td><td>3M/6M/12M bps</td><td>100m (328 ft.)</td></tr>
<tr><td>No. of Nodes</td><td colspan="2">32,62 with 1 repeater, 92 with 2 repeaters, 122 with 3 repeaters</td></tr>
<tr><td>No. of Repeaters</td><td colspan="2">3 repeaters max. per network</td></tr>
<tr><td>Max. No. of Slave Nodes</td><td colspan="2">60</td></tr>
<tr><td>Transmission Data Size</td><td colspan="2">Max. 32 bytes/station (normal service mode)
Max. 244 bytes/station (extended service mode)</td></tr>
<tr><td>Current Consumption (5VDC) (A)</td><td colspan="2">0.57</td></tr>
<tr><td>Weight (kg)</td><td colspan="2">0.15</td></tr>
<tr><td>Dimensions (W x H x D) mm (in)</td><td colspan="2">27.4 x 98 x 90 (1.08 x 3.86 x 3.54)</td></tr>
</table>

MELSEC Q Series / iQ DeviceNet™ Device Level Network Master Module

The DeviceNet master module allows the Q Series to control systems that require integration of third party DeviceNet products. The QJ71DN91 module is configured by use of the GX Configurator-DN plug-in for GX-Developer. Note that this module is also capable of functioning as a DeviceNet slave if required.

Model Number				QJ71DN91
Stocked Item				S
Certification				UL • cUL • CE
Node Type				DeviceNet master (Group 2 only client)
Node Number Which Can be Set				0 to 63
Functioning as Master	Number of Connections That Can Be Created	Message Connection		63
		I/O Connection		63 (polling, bit strobe, change of state, cyclic)
	Amount of Communication Data	I/O Communication	Send	Max. 4096 points (512 bytes), max 256 bytes per 1 node
			Receive	Max. 4096 points (512 bytes), max 256 bytes per 1 node
		Message Communication	Send	Max. 240 bytes
			Receive	Max. 240 bytes
Functioning as Slave	Node Type			DeviceNet slaves (Group 2 server)
	Setting Possible Node Number			0 to 63
	Number of Connections that be Created	I/O Connection		1 (polling)
	Amount of Communication Data	I/O Communication	Send	Max. 1024 points (128 bytes)
			Receive	Max. 1024 points (128 bytes)
Transmission Speed				One speed can be selected from 125, 250 and 500 kbit/s

Maximum Cable Length*						
	Communications speed	Maximum transmitting distance of trunk line			Length of drop line	
		Thick cables	Thin cables	Thick and thin cables coexist	Maximum	Total
	125 kbaud	500m (1640 ft.)	100m (328 ft.)	See the table below	6m (20 ft.)	156m (511 ft.)
	250 kbaud	250m (820 ft.)				78m (256 ft.)
	500 kbaud	100m (328 ft.)				39m (128 ft.)

Current Consumption Required on the Network (A)	0.03
Number of Times to Write Flash ROM	Max. 100000 times
Number of I/O Occupied Points	32 points (I/O allocation: Intelligent 32 points)
5VDC Internal Current Consumption (A)	0.17
Weight (kg)	0.11
Dimensions (W x H x D) mm (in)	27.4 x 98 x 90 (1.08 x 3.86 x 3.54)

* The maximum cable length complies with that in the DeviceNet specification (release 2.0) volumes 1 & 2.

Combined Distance of Thick and Thin Cables

Transmission Speed	Max, Combined Distance of Thick and Thin Cables
125 kbaud	Thick cable length + 5 x Thin cable length ≤ 500m (1640 ft.)
250 kbaud	Thick cable length + 2.5 x Thin cable length ≤ 250m (820 ft.)
500 kbaud	Thick cable length + Thin cable length ≤ 100m (328 ft.)

Required Manuals for DeviceNet

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800149	QJ71DN91 User's Manual (Hardware)	Covers basic information on QJ71DN91	Yes	–
SH(NA)080143	DeviceNet Master-Slave Module User's Manual	Covers programming of the QJ71DN91 module and GX-Configurator-DN	Included as PDF with GX-Configurator-DP	–

Note: Many of these manuals are available by free download from our website, www.meau.com

DeviceNet is a trademark of ControlNet International, Ltd. under license by Open DeviceNet Vendor Association, Inc.

Q Series / iQ PROFIBUS-DP V1 & V2 Device Level Network Master Module

The QJ71PB92V supports the more recent PROFIBUS-DPV1 and V2 advanced function set.

Key Features:

- PROFIBUS-DPV1 functions:
  - Acyclic slave communications
  - Slave alarm acquisition
- PROFIBUS-DPV2 functions:
  - Slave station clock control
- General functions:
  - Up to 125 slave stations
  - Support for slave configuration with CommDTM/FDT
  - Program using GX Configurator DP V7.0

PROFIBUS-DP Master Module Performance Specifications

Model Number		QJ71PB92V		
Stocked Item		S		
Certification		UL • cUL • CE		
PROFIBUS-DP Station Type		Class 1 master station		
Transmissions Specifications	External Standard & Characteristics	EIA-RS485 compatible		
	Communication Cable	Shielded twisted pair cable		
	Network Configuration	Bus type (tree type if repeater is used)		
	Data Link System	Master station <-> master station: Token passing system Master station <-> slave station: Polling system		
	Transmission Symbol Format	NRZ		
	Transmission Rate (*1) Maximum Transmission Distance (*2)	Transmission Rate	Transmission Distance	Max. Transmission Distance When Using Repeater (*2)
		9.6kbps	1200m/segment	4800m/network
		19.2kbps		
		93.75kbps		
		187.5kbps	1000m/segment	4000m/network
		500kbps	400m/segment	1600m/network
		1.5Mbps	200m/segment	800m/network
		3Mbps	100m/segment	400m/network
		6Mbps		
		12Mbps		
	Max. No. Of Repeaters In A Path	3 repeaters		
	Max. No. Of Stations	32 stations per segment (including repeaters)		
	Max. No. Slave Stations	125 slaves per single QJ71PB92V master		
	I/O Data Size	Max. 8192 words (4096 input words, 4096 output words)		
Number Of Flash ROM Writings		Max. 100,000 times		
Number of Occupied I/O Points		32 points (1/0 assignment: intelligent 32 points)		
5VDC Internal Current Consumption		0.57A		
External Dimensions (H x W x D) mm		98 x 27.4 x 90		
Weight (kg)		0.13		

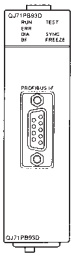
Notes:

1. Transmission rate control is within ±0.2% (compatible with IEC 61158-2).
2. The "maximum transmission distance" in the above table is an example which assumes that 3 repeaters are being used. If more repeaters are used to extend the distance, the maximum transmission distance would be calculated as follows: [Maximum transmission distance (m/network)] = [Number of repeaters +1] x [transmission distance (m/segment)]

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800324	Profibus-DP Master Module User's Manual (Hardware)	Covers basic information on QJ71PB92V	Yes	–
SH(NA)080572ENG	Profibus-DP Master Module User's Manual	Covers using the QJ71PB92V	No	–

Note: Many of these manuals are available by free download from our website, www.meau.com



MELSEC Q Series / iQ PROFIBUS-DP Device Level Network Slave Module

The QJ71PB93D allows a Q Series system to be connected to a third party PROFIBUS-DP network as a slave controller. This allows distributed processing systems to be built where local control of the application can be given to the Q Series, which then supplies information back to a supervisory controller. This could be another Q Series system, fitted with the QJ71PB92D. Configure the QJ71PB93D using the GX Configurator-DP plug in for GX Developer.

Model Number		QJ71PB93D		
Stocked Item		–		
Certification		UL • cUL • CE		
PROFIBUS-DP Station Type		Slave station (EN50170 Volume 2 (Parts 1-4, 8) compliant)		
Station Number Setting Range		0 to 125 (*3)		
Max. Communication Data Size		Number of I/O data is 192 words in total (Number of input or output data is up to 122 words)		
Transmission Specifications	Electrical Standards	Complies with EIA-RS485		
	Network Cable	Dedicated PROFIBUS DP cable		
	Network Configuration	Bus (tree type when a repeater is used)		
	Data Link Method	Polling method		
	Transmission Encoding Method	NRZ		
	Transmission Speed / Maximum Transmission Distance (*1, *2)	Transmission Speed	Transmission Distance [m/segment]	Max. Transmission Distance with 3 repeaters [m]
		9.6 [kbps]	1200	4800
		19.2 [kbps]		
		45.45 [kbps]		
		93.75 [kbps]		
		187.5 [kbps]	1000	4000
		500 [kbps]	400	1600
		1500 [kbps]	200	800
		3 [Mbps]	100	400
		6 [Mbps]		
		12 [Mbps]		
	Max. Number of Repeaters / Network	3 units (*2)		
	Max. Number of Stations / Segment	32 stations (including repeaters)		
	Number of Connection Nodes / Segments	32		
Terminating Resistor		Required		
Maximum Number of Flash ROM Writing		10,000 times		
Number of Occupied I/O		32 points (I/O assignment: 32 intelligent points)		
5VDC Internal Power Consumption		0.44		
Weight (kg)		0.11		
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.54)		

Notes:

1. Transmission speed control within ±3% (Compliant with EN50170 Volume 2)
2. Distance that the transmission distance can be expanded by (m/network) using repeaters.
   Maximum transmission distance (m/network) = (number of repeaters + 1) x transmission distance (m/segment)
3. Factory set to "126" (EN50170 Volume 2 compliant)
   Set the station number by using sequence program or GX Configurator-DP 4.03D or later.
   Set communication parameters on the master station side.
   GSD (DDB) file may be required without GX Configurator-DP Version 4.03D or later. Please contact your local Mitsubishi representative for the GSD (DDB file).

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080318	Profibus-DP Slave Module type QJ71PB93D User's Manual	Covers QJ71PB93D and GX Configurator-DP	No	–
IB(NA)0800230	Profibus-DP Slave Module User's Manual (Hardware) QJ71PB93D	Basic information on QJ71PB93D	Yes	–

MELSEC Q Series / iQ MODBUS/TCP Network Module

The QJ71MT91 module offers a full MODBUS/TCP network communications facility to any Q Series system. Use this module to establish control of a MODBUS/TCP network of devices from a Q Series based system.

Key Features:

- Module set-up via menus in GX Developer; no programming required (requires use of GX Configurator-MB plug in)
- GX Configurator-MB reduces maintenance time with clear presentation of module status
- Master communication function supports both automatic communications or communication under program control if required
- Also supports slave communication functions including automatic response and MODBUS device assignment
- Both slave and master functions can operate concurrently
- GX Developer connection via Ethernet
- 100Mbit Ethernet capability with KeepAlive and router relay functions

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800280	MODBUS/TCP Interface Module User's Manual (Hardware) QJ71MT91	Basic information on QJ71MT91	Yes	–
SH(NA)080446ENG	MODBUS/TCP Interface Module User's Manual	Covers QJ71MT91 & GX Configurator MB	Included with GX Configurator MB as PDF	–

MELSEC Q Series / iQ MODBUS/TCP Network Module

Model Number			QJ71MT91	
			10BASE-T	100BASE-TX
Stocked Item			S	
Certification			UL • cUL • CE	
Transmission Specifications	Data Transmission Rate		10Mbps	100Mbps
	Transmission Method		Base band	
	Maximum Node-To-Node Distance		200m	
	Maximum Segment Length (*1)		100m	
	Number Of Cascade Connection Stages		Max. 4 stages	Max. 2 stages
	Maximum Number Of Connections (*2)		64 connections	
	Number Of Routers That Can Be Set		1 default router + any 8 routers	
	Cable		Cable compliant with the IEEE802.3 10BASE-T Standard (unshielded twisted pair cable (UTP cable), Category 3 4, 5)	Cable compliant with the IEEE802.3 100BASE-TX Standard (shielded twisted pair cable (STP cable), Category 5)
	Connector Applicable For External Wiring		RJ45	
Master Function	Automatic Communication Function	Number Of Slaves (*3)	64 slaves	
		Function (For Send)	7 functions	
		Input Area Size	4k words	
		Output Area Size	4k words	
	Dedicated Instruction	Number Of Instructions That Can Be Executed Concurrently (*4)	Up to 8 instructions	
		Function (For Send)	MBRW instruction: 9 functions; MBREQ instruction: 19 functions	
		Input Area Size	Max. 253 bytes per instruction	
		Output Area Size	Max. 253 bytes per instruction	
Slave Function	Automatic Response Function	Function (For Receive)	12 functions	
	MODBUS Device Size	Coil	64k points	
		Input	64k points	
		Input Register	64k points	
		Holding Register	64k points	
		Extended File Register	Max. 4086k points	
	No. of Simultaneously Acceptable Request Messages		64	
GX Developer Connection Function	Number Of Simultaneously Connectable GX Developers		Max. 8	
Number Of Occupied I/O Points			32 points	
5VDC Internal Current Consumption			0.52A	
External Dimensions (W x H x D) mm (in)			27.4 x 98 x 90 (1.08 x 3.86 x 3.54)	
Weight (kg)			0.11	

Notes:
1. Length between a hub and a node.
2. Indicates the number of TCP connections that can be established simultaneously.
3. Indicates the maximum number of slaves that can be communication targets.
4. Indicates the maximum number of dedicated instructions that can be started simultaneously from a sequence program.

MELSEC Q Series / iQ MODBUS® RTU Master Module

The QJ71MB91 module adds Modbus RTU capability to a Q Series system. Use this module to communicate with and control any of a wide variety of third party Modbus compatible products.

Key Features:

- Module set-up via menus in GX Developer; no programming required (requires use of GX Configurator-MB plug in)
- GX Configurator-MB reduces maintenance time with clear presentation of module status
- Supports master communication with automatic communication
- Dedicated instructions are available for communications
- Supports slave communications with automatic response and device assignment function
- Link operation function; allows a third party Modbus device to communicate with Modbus slaves connected to the Q Series controller via the QJ71MB91 module
- 115.2kbps communication speed

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800329	Modbus Interface Module User's Manual (Hardware)	Basic information on the QJ71MB91	Yes	–
SH(NA)080578ENG	Modbus Interface Module User's Manual	Covers QJ71MB91 and GX Configurator MB	No	–

Note: Many of these manuals are available by free download from our website, www.meau.com. Modbus is a registered trademark of Schneider Electric.

<table>
<tr><th colspan="3">Model Number</th><th>QJ71MB91</th></tr>
<tr><td colspan="3">Stocked Item</td><td>S</td></tr>
<tr><td colspan="3">Certification</td><td>UL • cUL • CE</td></tr>
<tr><td rowspan="4">Transmission Specifications</td><td colspan="2">Number of Interfaces</td><td>RS-232 1 channel; RS-422/485 1 channel</td></tr>
<tr><td colspan="2">Transmission Speed</td><td>Total transmission speed of two interfaces must be 115200 bps or less.
300 | 600 | 1200 | 2400
4800 | 9600 | 14400 | 19200
28800 | 38400 | 57600 | 115200
(bps)</td></tr>
<tr><td rowspan="2">Transmission Distance (Overall Distance)</td><td>RS-232</td><td>Max. 15m (49.2 ft.)</td></tr>
<tr><td>RS-422/485</td><td>Max. 1200m (3936.9 ft.) (Overall distance)</td></tr>
<tr><td rowspan="8">Master Function</td><td rowspan="4">Automatic Communication Function</td><td>Number of Slaves (*1)</td><td>32 per channel</td></tr>
<tr><td>Function (For Send)</td><td>7 functions</td></tr>
<tr><td>Input Area Size</td><td>4k words</td></tr>
<tr><td>Output Area Size</td><td>4k words</td></tr>
<tr><td rowspan="4">Dedicated Instruction</td><td>Number of Instructions That Can Be Executed Concurrently (*2)</td><td>1 per channel</td></tr>
<tr><td>Function (For Send)</td><td>MBRW instruction: 9 functions MBREQ instruction: 19 functions</td></tr>
<tr><td>Input Area Size</td><td>Max. 253 bytes per instruction</td></tr>
<tr><td>Output Area Size</td><td>Max. 253 bytes per instruction</td></tr>
<tr><td rowspan="8">Slave Function</td><td>Automatic Response Function</td><td>Function (For Receive)</td><td>17 functions</td></tr>
<tr><td rowspan="5">MODBUS® Device Size</td><td>Coil</td><td>64k points</td></tr>
<tr><td>Input</td><td>64k points</td></tr>
<tr><td>Input Register</td><td>64k points</td></tr>
<tr><td>Holding Register</td><td>64k points</td></tr>
<tr><td>Extended File Register</td><td>Max. 4086k points</td></tr>
<tr><td colspan="2">No. of Simultaneously Acceptable Request Messages</td><td>1 Request Per Channel</td></tr>
<tr><td colspan="2">Station No.</td><td>1 to 247</td></tr>
<tr><td colspan="3">Number of Occupied I/O Points</td><td>32 points</td></tr>
<tr><td colspan="3">5VDC Internal Current Consumption</td><td>0.31A</td></tr>
<tr><td colspan="3">External Dimensions (H x W x D) mm (inch)</td><td>98 x 27.4 x 90 (3.86 x 1.08 x 3.54)</td></tr>
<tr><td colspan="3">Weight (kg)</td><td>0.20</td></tr>
</table>

Notes:
1. Indicates the maximum number of slaves that can be communication targets.
2. Indicates the maximum number of dedicated instructions that can be activated simultaneously from a sequence program.

Screw Location	Tightening Torque Range
Terminal Screw for RS-422/485 Terminal Block (M3 Screw)	0.42 to 0.58N•m
Mounting Screw for RS-422/485 Terminal Block (M3.5 Screw)	0.66 to 0.89N•m
Module Fixing Screw (Usually Not Required) (M3 Screw) (*1)	0.36 to 0.48N•m

Note:
1. The module can be easily fixed to the base unit with the hook on the top of the module. In the operating environment where high vibration and/or strong impact are observed, however, it is recommended to fix the module with the module fixing screws.

MELSEC Q Series CC-Link/LT Sensor Level Network Master Module

CC-Link/LT

The QJ61CL12 allows the Q Series to control a CC-Link/LT network segment. Key features of CC-Link/LT are:

- Connect network devices with no cutting or stripping of cable
- I/O is addressed like it was on the rack; no special programming required
- Control up to 1024 I/O per master
- Compatible with CC-Link
- Fine granularity of I/O allows placement of small groups of I/O where required
- Required manuals listed at bottom of page.

Model Number				QJ61CL12		
				4-Point Mode	8-Point Mode	16-Point Mode
Stocked Item				S		
Certification				UL • cUL • CE		
Control Specifications	Max. Number of Link Points [When The Same I/O Address Is Used]			256 points (512 points)	512 points (1024 points)	1024 points (2048 points)
	Number of Link Points Per Station [When The Same I/O Address Is Used]			4 points (8 points)	8 points (16 points)	16 points (32 points)
	Link Scan Time (ms)	When 32 Stations Are Connected	Number of Points	128 points	256 points	512 points
			2.5Mbps	0.7	0.8	1.0
			625kbps	2.2	2.7	3.8
			156kbps	8.0	10.0	14.1
		When 64 Stations Are Connected	Number of Points	256 points	512 points	1024 points
			2.5Mbps	1.2	1.5	2.0
			625kbps	4.3	5.4	7.4
			156kbps	15.6	20.0	27.8
Communication Specifications	Transmission Rate (bps)			2.5M / 625k / 156k		
	Communication Method			BITR (Broadcast polling + Interval Timed Response)		
	Communication Path			T-branch		
	Error Control Method			CRC		
	Number of Connected Units			64		
	Remote Station Numbers			1 to 64		
	Master Station Connection Position			Connected to the end of the main line		
	RAS Function			Network diagnostics, internal loopback diagnostics, station detach function automatic return to system		
	Connection Cable			Dedicated flat cable (0.75mm² x 4) CL9-FL4-18		
I/O Occupied Points (*1)				16, 32, 48, 64, 128, 256, 512, 1024 (I/O assignment: Intell.)		
5VDC Internal Current Consumption				0.13 A		
24VDC Power Supply (*2)	Voltage			20.4 to 28.8 VDC		
	Current Consumption			0.028 A		
	Current on Startup			0.070 A		
Weight (kg)				0.09		

Notes: 1. Set by module switches; **2.** External supply

MELSEC Q Series AS-i Sensor Level Network Master Module

The AS-i module allows Q Series to control systems that require integration of third party AS-i sensor level network products. The GX Configurator-AS plug in for GX Developer configures the QJ71AS92 module.

Model Number		QJ71AS92
Stocked Item		S
Certification		CE
Max. Number of AS-i System Slaves		62 (Group A: 31, Group B: 31)
Max. Number of I/O Points (1 Point = 16 Bits)	Input	248 points
	Output	248 points
Max. Number of Analog I/O Points (1 Point = 1 Bit)	Input	124 points
	Output	124 points
I/O Refresh Time		Approx. 5 ms (without I/O slave grouping); Approx. 10 ms (with I/O slave grouping); Approx. 35 ms (per analog slave channel)
Communication Speed		167 kbps
Transmission Distance		Max. 100m (Max. 300m by use of two repeaters)
Connection Type		Bus network type (any of star, line, tree and ring enabled)
Communication Method		APM modulation method (Alternating Pulse Modulation)
Error Control Method		Parity check
Internal Memory		EEPROM (for parameter registration), number of writes: 100,000 times
Number of Occupied I/O Points		32 points (I/O assignment: 32 intelligent points)
Applicable Wire		Use AS-i cable
External Power Supply	Voltage	TYP. 30.5 VDC (supplied by AS-i power supply)
	Current Consumption	46mA (TYP 30.5 VDC)
5VDC Internal Current Consumption		0.40A
Weight (kg)		0.12
Dimensions (W x H x D) mm (in)		27.4 x 98 x 90 (1.08 x 3.86 x 3.54)

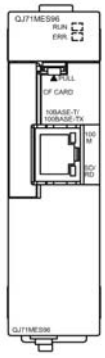
Required Manuals

Model Number	Description	Contents	Included?	Stk Item
IB(NA)0800232	QJ61CL12 CC-Link/LT Master Module User's Manual (Hardware)	Basic information on QJ61CL12	Yes	–
SH(NA)080351	CC-Link/LT Master Module User's Manual QJ61CL12	Covers QJ61CL12 and CC-Link/LT	No	–
SH(NA)080291	AS-i Master Module User's Manual	Covers QJ71AS92 and GX Configurator-AS	Supplied as a PDF with GX Configurator-AS	–
IB(NA)0800225	AS-i Master Module User's Manual (Hardware) QJ71AS92	Basic information on QJ71AS92	Yes	–

MELSEC Q Series Standard MES Interface Module

As part of Mitsubishi's e-F@ctory technology, the QJ71MES96 module allows a direct connection from a Q Series Automation Platform controller on the shop floor to high level IT MES (Manufacturing Execution Systems) infrastructure. This offers the following benefits:

- No need for intermediate PC infrastructure to interface shop floor controllers to "front office" IT systems
- Significantly reduced cost of ownership as no PC maintenance issues apply
- Improved security; prevents access by unauthorized personnel
- Improved productivity; industrially hardened architecture is immune to typical PC reliability issues
- High speed Ethernet connection from shop floor to "front office" IT systems
- Convenient installation; module simply mounts in a spare Q Series slot and configures with dedicated software tool (MX-MESIF-STD-C1)



Required Manuals for QJ71MES96

Model Number	Description	Contents	Included?	Stocked Item
IB(NA)0800354	QJ71MES96 MES Interface Module User's Manual (Hardware)	Basic information on QJ71MES96 module	Yes	–
SH(NA)080644ENG	QJ71MES96 MES Interface Module User's Manual	Complete information on how to use the MES interface module and associated software	No (purchase separately)	–

Performance Specifications

Model Number		QJ71MES96	
Stocked Item		S	
Certification		UL • cUL • CE	
Ethernet	Interface (*1)	10BASE-T	100BASE-TX
	Data Transmission Rate	10 Mbps	100 Mbps
	Transmission Method	Base band	
	Number of Cascaded Stages	Maximum 4 stages	Maximum 2 stages
	Max. Segment Length (*2)	100 m	
	Supported Function	The auto-negotiation function is available. (automatically distinguishes 10BASE-T from 100BASE-TX)	
Compact Flash Card	Supply Power Voltage	3.3V ±5%	
	Supply Power Capacity	Maximum 150 mA	
	Card Size	TYPE I card	
	Number of Mountable Modules	1	
Number of Occupied I/O Points		32 points/slot (I/O assignment: Intelli. 32 points)	
Clock		The clock data is obtained from a PLC CPU (in multiple CPU system, CPU No.1) or the SNTP server computer	
5VDC Internal Current Consumption		0.65A	
External Dimensions H x W x D mm (in)		98 x 27.4 x 90 (3.86 x 1.08 x 3.54)	
Weight (kg)		0.16	

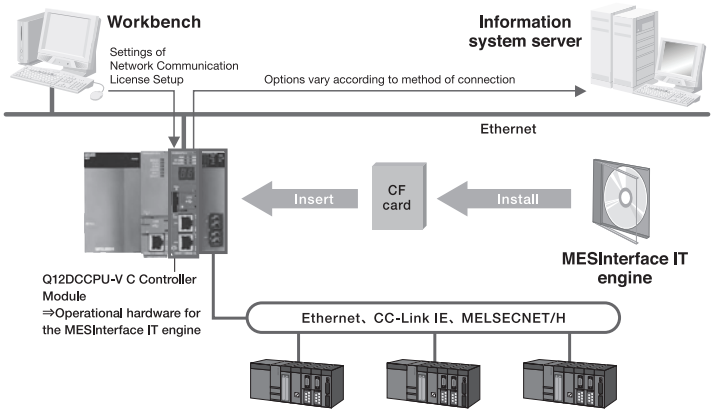
Notes:

1. The MES interface module distinguishes 10BASE-T from 100BASE-TX depending on the device on other end. For connection with a hub not having the auto-negotiation function, set the hub side to half-duplex auto communication mode.
2. Distance between a hub and node.

Q Series MES Interface IT Module

The MES Interface IT and e-F@ctory technology solves the difficult challenge of efficiently linking factory and IT systems to enable comprehensive data collection and distribution. It achieves system standardization security, and high data reliability for any system from individual machines to large scale production lines.

- Access to accurate and reliable production information
- Dramatically simplified system architecture
- Reduced integration time and effort
- Improved security and standardization
- Achieves lean and agile operation at the lowest cost of ownership



MES Interface

Product Interface	Model Number	Stocked Item	Installation Location	Description
MES Interface IT	QJ71MES96IT	S	Includes Appliance, Compact Flash Card and Core Software	MES IT platform with 5 device connections

Functions

Tag Enumeration Function		Collects tag information such as PLC device data PLC devices (including aliases) Local variable (internal variable effective only during trigger-based execution) Static variable (variable that retains data even after trigger-based execution) Macro (system-defined values) Constant
Transport Setting Function (Method Of Communication with the Host Information System		Sets the method of communication with the host information system
	Database	Allows direct access with the database by external interface (JMS type)
	Message	Allows message transmission to and message receipt from the host information system
Database Interface Function		Accesses the database in the host information system
	SQL Message Generation	Automatically generates SQL messages and communicates with the database. The following SQL messages can be generated: Select; Batch insert (inserts multiple lines collectively); Update; Select; Delete; Select with delete (deletes a selected line); Select with update (Performs select and update as a single task); Stored Procedure; Count rows (selects the relevant number of rows)
Message Communication Function		Sends and receives messages to and from the information system
	Message Sending	Construct and send messages to the information system
	Message Receiving	Receive and process messages from the information system
Trigger Monitoring Function		Monitors time and tag information, activates the database interface, and message communication functions in accordance with trigger conditions
Arithmetic Processing Function		Arithmetically processes the data that is to be sent/received using the database interface and message communications functions
Buffering Function		Buffers data that is received from or is to be sent to the information system
	Local Database	Creates a local database in the module
	Communication Data Recovery (Store & Forward)	In the event of a communication error with the information system, data is temporarily stored to a CompactFlash card in the module, (time-stamped with the trigger time) and re-forwarded to the system after recovery
Security Function		Role-based security infrastructure that controls information and function access among users. Provides audit operation logging
Time Synchronization Function		Synchronized the time of the interface module and the time of the network SNTP server

Performance Specifications

Data Transport Method	**Databases**	Oracle 10g, 11g; Microsoft SQL Server 2000, 2005; IBM DB2 8,9; IBM DB2/400 V5R3; Local DB
	Messages	WebSphere MQ; JMS; SMTP (e-mail); TCP; HTTP
Data Transport Map	**SQL Commands Supported by the Database Interface Function**	Insert; Batch Insert; Update; Select; Delete; Select with Delete; Select with Update; Stored Procedure; CountRows
	Message Style	ASCII (delimited format, free format), XML
	Character Code	UTF-8
	Max. Store and Forward Capacity	10,000MB/transport However, the volume actually used does not exceed the capacity of a CompactFlash card (512MB)
Trigger	**Trigger Conditions**	Fixed cycle (Schedule-Periodic); Fixed time (schedule); Value monitoring (Data); Listner (Listner); Manual operation (On Demand); Boot from separate trigger (Sub Trigger); MES Interface IT event (Internal); Top management communication event (Enterprise); Event from separate system with multiple CPUs (GINT command)
	Actions	Numerical processing (referencing other numerical operations) (Expression); Standby (Wait); Device writing (Set); Array operation (Array); Bit operation (Bit); Device control (Device); Communication from top management (Enterprise Communication); Setting display (Hardware); Correction of internal data (internal); PING operation (Ping); Job control (Routing); File operation (Staging File System); Character string operation (String); Boot trigger (Trigger)
	Operations	Four arithmetic operation (+, -, x. /); abs (absolute value); acos (inverse cosine); asin (inverse sine); atan (inverse tangent); avg (average); cos (cosine); cosh (hyperbolic cosine function); exp (exponential function); ln (natural logarithm); log (logarithmic function); log10 (common logarithm); max (maximum value); min (minimum value); sin (sine); sinh (hyperbolic sine function); sqrt (square root); sum (total); tan (tangent); tanh (hyperbolic tangent function)

Options for: QJ71MES96IT

Model Number	Description	Stocked Item
MESITLCLDTBS	MES IT Local Database	S
MESITTRNSSQL	MES IT SQL Transport	S
MESITTRNSORCL	MES IT ORCL Transport	S
MESITTRNSDB2	MES IT DB2 Transport	S
MESITTRNSSIB	MES IT SIB Transport	S
MESITTRNSWMQ	MES IT WMQ Transport	S
MESIT2GBCF	MES IT 2GB Memory Card	S
QJ71MES96IT	MES Interface IT Module	S
MESITDVC-1	MES IT 1 Device Connections	S
MESITDVC-5	MES IT 5 Device Connections	S
MESITDVC-10	MES IT 10 Device Connections	S
MX-MES-INTRFC-IT	MES Interface IT Workbench	S

F Accessories

MELSEC Q Series GX Configurator Software Tools

One of the key benefits of the Q Series is the way a system can be configured simply via menus in GX-Developer, rather than spend time on writing program code to achieve this. This facility is provided by "plug-in" utilities for GX-Developer, known as Intelligent Function Utilities. These are supplied in four different parts, depending on what your requirements are. See the software section of this Selection Guide for ordering details.

MELSEC Q Series Programming Cables

Depending on the CPU type being used, either a serial or USB connection can be made to a CPU from GX Developer as follows:

CPU	Connections Available	Cable to Use
Q00J, Q00, Q01, Q02	Serial RS232	SC-Q (serial connection)
Q02H, Q06H, Q12H, Q25H, Q12PH, Q25PH	Serial RS232 & USB	SC-Q (serial connection) or third party USB cable

Note: Not all common operating systems (such as Microsoft® Windows® NT) support a USB connection.

MELSEC Q Series Memory Card Adapter

The Q2MEM-ADP adapter allows a Q Series memory card (Q2MEM-□MB□) to be installed in a standard PC Card (PCMCIA) slot for reading and writing to the card. Non-Stock product.

MELSEC Q Series / iQ Memory Cards

Q Series memory cards are optional memory expansions. Use these cards to expand the CPU memory up to 32Mb. Memory cards may be used for storage of programs, data and system documentation. Note these are only used with sequence CPUs. Program memory is not increased by adding memory cards.

Required Manuals

Model Number	Description	Contents	Included?	Stocked Item
SH(NA)080484ENG	QCPU(Q Mode) User's Manual (Function Explanation, Program Fundamentals)	CPU specifications, system configuration, Programming basics, I/O assignments, memory organization, CPU functions, communication with intelligent function modules, parameters & devices, program up/downloads, overview of multiple program architecture, programming basics	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Memory Cards

Type	Memory Type	Capacity	Write Count (Times)	Certification	Stocked Items
Q2MEM-1MBS	SRAM	1,011kb	No restriction	UL • cUL • CE	S
Q2MEM-2MBS	SRAM	2,034kb	No restriction	UL • cUL • CE	S
Q2MEM-2MBF	Linear flash ROM	2,032kb	100,000	UL • cUL	S
Q2MEM-4MBF	Linear flash ROM	4,080kb	100,000	UL • cUL	–
Q3MEM-4MBS	SRAM	4,078kb	No restriction	UL • cUL • CE	–
Q3MEM-4MBS-SET	Set consisting of Q3MEM-4MBS & protective cover	N/A	N/A	UL • cUL • CE	–
Q2MEM-8MBA	ATA flash ROM	7,940kb	1,000,000	UL • cUL	–
Q3MEM-8MBS	SRAM	8,172kb	No restriction	UL • cUL • CE	–
Q3MEM-8MBS-SET	Set consisting of Q3MEM-8MBS & protective cover	NA	N/A	UL • cUL • CE	–
Q2MEM-16MBA	ATA flash ROM	15,932kb	1,000,000	UL • cUL	–
Q2MEM-32MBA	ATA flash ROM	31,854kb	1,000,000	UL • cUL	–

Note: Both the linear flash ROM and ATA flash ROM are rewritable non-volatile memories. For replacement memory card back-up batteries, please see the Accessories section.
For certain sequence CPU functions to be enabled, specific types of memory card are required. Please refer to the relationship between memory cards and supported data type to select the memory card that best meets your needs.

Relationship Between Memory Cards and Supported Data Type

Drive No.	Memory Card (RAM)	Memory Cards (ROM)		File Name And Extension
	SRAM Card	Flash Card	ATA Card	
	Q2MEM-1MBS Q2MEM-2MBS Q3MEM-4MBS Q3MEM-8MBS	Q2MEM-2MBF Q2MEM-4MBF	Q2MEM-8MBA Q2MEM-16MBA Q2MEM-32MBA	
Parameter	✔	✔	✔	PARAM.QPA
Intelligent Function Module Parameter	✔	✔	✔	IPARAM.QPA
Program	✔ (*1)	✔ (*1)	✔ (*1)	***.QPG
Device Comment	✔ (*2)	✔ (*2)	✔ (*2)	***.QCD
Device Initial Value	✔	✔	✔	***.QDI
Device Data	—	—	—	***.QST
File Register	✔	✔ (*3)	—	***.QDR
Local Device	✔	—	—	***.QDL
Sampling Trace File	✔	—	—	***.QTD
Failure History Data	✔	—	—	***.QFD
PLC User Data	—	—	✔	***.***

For program storage only. Does not increase program memory.

Notes:
1. To execute the program stored in the standard ROM or memory card, adjusting the program memory boot settings is required in the PLC parameter dialog box. Note that the Universal model QCPU cannot boot data from the standard ROM to the program memory.
2. Read from a sequence program requires several scans.
3. Read only from a sequence program.

Memory Card		CPU Module				
		Q00JCPU Q00CPU Q01CPU	Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	Q12PHCPU Q25PHCPU	Q12PRHCPU Q25PRHCPU	Q02UCPU Q03UDCPU Q04UDHCPU Q06UDHCPU
SRAM Card	Q2MEM-1MBS	—	✔	✔	✔	✔
	Q2MEM-2MBS	—	✔	✔	✔	✔
	Q3MEM-4MBS	—	—	—	—	✔
	Q3MEM-8MBS	—	—	—	—	✔
Flash Card	Q2MEM-2MBF	—	✔	✔	✔	✔
	Q2MEM-4MBF	—	✔	✔	✔	✔
ATA Card	Q2MEM-8MBA	—	✔	✔	✔	✔
	Q2MEM-16MBA	—	✔	✔	✔	✔
	Q2MEM-32MBA	—	✔	✔	✔	✔

Note: Only one memory card can be installed for each CPU module.

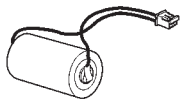
MELSEC Q Series Memory Card Replacement Battery

Use these batteries to maintain the contents of SRAM memory cards after power down.

Model Number	Q2MEM-BAT	Q3MEM-BAT
Stocked Item	S	–
Classification	Graphite fluoride lithium primary battery	Manganese dioxide lithium primary battery
Initial Voltage	3.0V	3.0V
Nominal Current	48mAh	550mAh
Storage Life	5 years (room temperature)	
Lithium Content	0.014g	0.150g
Application	Power failure backup for SRAM card (for Q2MEM-1MBS/Q2MEM-2MBS)	Power failure backup for SRAM card (for Q3MEM-4MBS/Q3MEM-8MBS)

MELSEC Q Series CPU Memory Replacement Battery

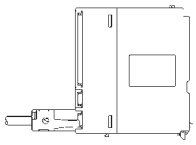
All Q Series CPUs employ RAM based memory. To insure this is preserved after power down, use the Q6BAT or Q7BAT. Note these are not compatible with the A6BAT. Any RAM based memory cards installed in the CPU use the Q2MEM-BAT for back-up and are independent of the Q6BAT. One Q6BAT is shipped with each CPU.



Model Number	Q6BAT			
Stocked Item	S			
Battery Lifetime	CPU Type	Min. Back-Up Time	Typical Back-Up Time	Back-Up Time After Battery Error ON
	Q02	5,433 hours	13,120 hours	120 hours
	Q02H, Q06H	2,341 hours	6,435 hours	120 hours
	Q12H, Q25H, Q12PH, Q25PH	1,260 hours	4,228 hours	48 hours

Model Number	Q7BAT/Q7BAT-SET			
Stocked Item	–			
Battery Lifetime	CPU Type	Min. Back-Up Time	Typical Back-Up Time	Back-Up Time After Battery Error ON
	Q02	13,000 hours	31,000 hours	240 hours
	Q02H, Q06H	5,000 hours	14,000 hours	240 hours
	Q12H, Q25H, Q12PH, Q25PH	2,900 hours	9,700 hours	96 hours

MELSEC Q Series Connector Disconnection Prevention Holder



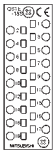
The Q6HLD-R2 is a clamp that fixes a cable securely to the RS-232 port of a Q Series CPU to prevent accidental disconnection. It is adjustable to accommodate different cable designs and does not block access to the USB port, where available

Model Number	Q6HLD-R2
Stocked Item	–
Required Manuals	IB(NA)0800181 Included.

MELSEC Q Series Spare Parts

Model Number	Description	Stocked item
BKO-C8834H12	Spare CC-Link terminating resistors 2 x 110 ohm, 2 x 130 ohm, fitted with insulated lugs	–
BKO-C10798H02	QJ61BT11N CC-Link network master module network connection terminal block	–
K08H07500150	QXn0/QYn0 I/O block complete terminal block assembly (screw terminal block, hinged cover and label) (Fits QX10, QY10, etc.)	–
K08H07500151	Hinged cover and label only from K08H07500150	–

MELSEC Q Series Spring Clamp Terminal Block



The Q6TE-18S fits most Q Series 16 point (or less) I/O modules and allows terminations to be made via a spring clamp. This offers the benefit of making wiring connections without using wiring lugs.

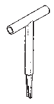
Model Number	Q6TE-18S
Stocked Item	S
Required Manuals	IB(NA)0800204 Included.

MELSEC Q Series IDC Terminal Block adapter

The Q6TA32 allows some I/O modules to offer an IDC (insulation displacement connector) type wiring connection. This makes wiring less expensive and faster, as wires do not need to be stripped or have a lug fitted. Wire is simply pushed into the receptacles on the adapter, and held firmly by the IDC connection.

Model Number	Q6TA32
Stocked Item	–
Required Manuals	IB(NA)0800228 Included.

MELSEC Q Series IDC Insertion Tool



Use the Q6TA32-TOL to fit wires into the IDC receptacles of the Q6TA32.

Model Number	Q6TA32-TOL
Stocked Item	–

MELSEC Q Series Program Loader EQLDR01

The EQLDR-01 program loader provides a convenient handheld device that can be used to upload, store, transfer and download programs for basic Q CPUs that do not have a memory card slot. The EQLDR-01 also accepts standard off the self compact flash memory cards for inexpensive transfer of programs from one loader to another.

Required Manuals

Model Number	Description	Stocked Item
50EM8508-A	EQLDR01 User's Manual	–

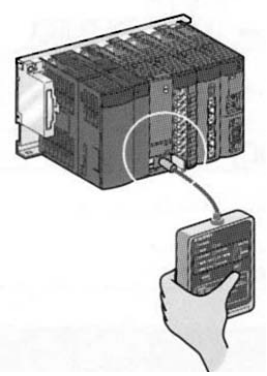
Q Series Program Loader EQLDR01 Performance Specifications

Model Number			EQLDR01
Stocked Item			S
External Interface	QCPU RS-232	Connection Method	Cable integral with unit
		Transmission Speed	115.2Kbps
		Cable Length	0.2m
	Compact Flash card	Power Supply Voltage	3.3VDC ±5%
		Card Size	TYPE I
		Maximum Number Of Mountable Cards	1
Display LEDS			Power supply display Data valid status display Mode selection/execution status display
Operations Buttons			Mode selection Execution button
Power Supply			Received from CPU (5VDC)
Current Consumption (5VDC)			0.31A
Weight (kg)			0.14
External Dimensions (Excluding Cable) H x W x D mm (in)			110 x 75 x 27.5 (4.33 x 2.95 x 1.08)
Maximum Processing Time of Each Mode			See table below
Ambient Temperature	During Use		0 to 55°C
	During Storage		-25 to 75°C
Ambient Humidity	During Use		5 to 95% RH, non-condensing
	During Storage		5 to 95% RH, non-condensing

		Q00JCPU	Q00CPU	Q01CPU
CPU WR	Internal Memory	about 37s	about 93s	
	Compact Flash™ Card	about 36s	about 96s	
CPU RD	Internal Memory	about 24s	about 58s	
	Compact Flash™ Card	about 21s	about 54s	
MEM.—CF		about 2s	about 3s	
CF—MEM.		about 5s	about 7s	
MEM.CLR.		about 6s		
CF CLR.*		about 2s (The processing time differs according to capacity.)		

*With Compact Flash™ card capacity of 32 MB

CPU Connection



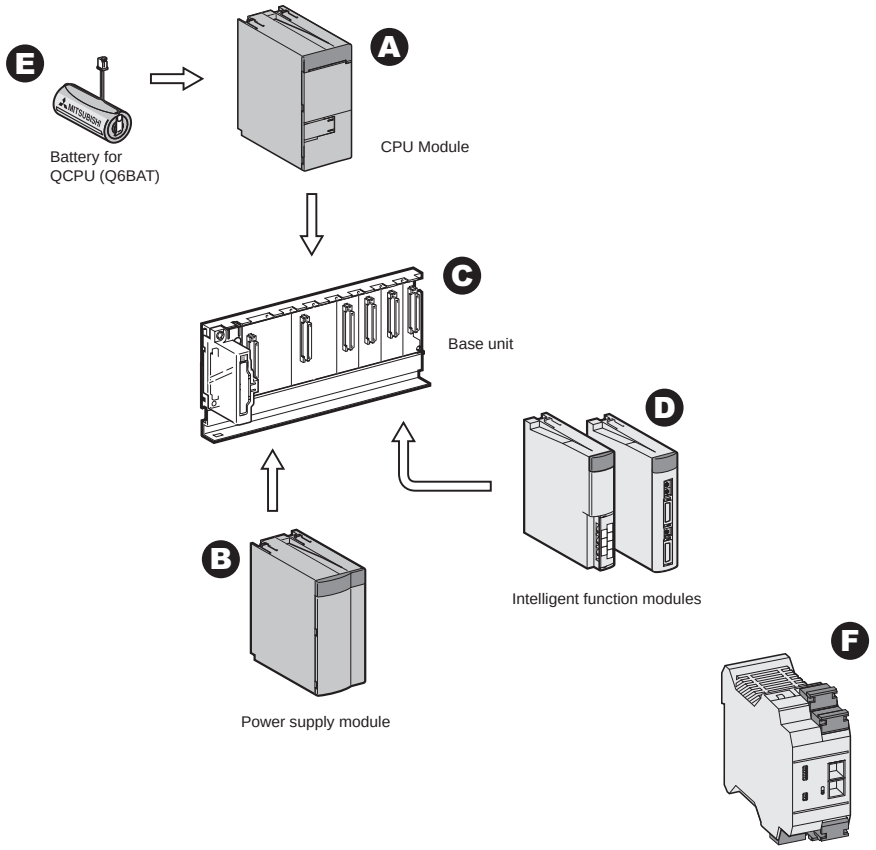
MELSEC QS Safety

The MELSEC Safety lineup provides innovative solutions to applications requiring accident-free user operation. For Category 4 Safety control, the QS Safety PLC uses TÜV certified function block programming and CC-Link Safety to integrate both safety and non-safety assets into a single seamless system. Safety rated Light Curtains, Electromechanical Switches, and Laser Scanners can all be incorporated to minimize danger to the operator. Another way to add safety control to a non-safety system is by using the Safety Relay Modules, which provide independent Category 3 Safety I/O control and can be monitored via the Q Bus or standard CC-Link.

Key Features:

- QS PLC is TÜV certified to IEC61508 SIL 3 & ISO13849-1 Category 4
- Safety Function Blocks included with standard GX Developer programming software for easy failsafe programming
- Reduced wiring costs using CC-Link Safety device level network for both Safety and Non-Safety I/O
- Built-in User Management to the programming environment for different levels of user access
- QS PLCs have Test Mode and Safety Mode for easy pre-commission trouble-shooting
- Safety Relay Modules are easily integrated with existing control systems
- Safety Relay Modules require no programming and an optional partial system shutdown feature

System Configuration



A. CPU Modules 77
B. Base Units 78
C. Power Supply Modules 78
D. Intelligent Function Modules 79
E. Battery 82
F. Safety Relay Modules 82

Required Manuals

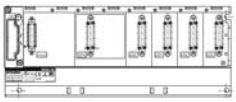
Model Number	Description	Contents	Included?	Stk Item
SH(NA)080626ENG	QSCPU User's Manual (Hardware Design, Maintenance & Inspection)	Overview, system configuration, general specifications, CPU module, power supply module, base unit, battery, startup, EMC & LVD, loading & installation, maintenance & inspection, troubleshooting	No (purchase separately)	–
SH(NA)080627ENG	QSCPU User's Manual (Function Explanation, Program Fundamentals)	Overview, performance specifications, sequence program execution, I/O assignment, memory & file handling, functions, communication with IFM, parameters, devices, procedures for writing programs to CPU	No (purchase separately)	–
SH(NA)080628ENG	QSCPU Programming Manual (Common Instructions)	General description, instruction tables, configuration of instructions, how to read instructions, sequence instructions, basics instructions, application instructions, QSCPU dedicated instructions, error codes	No (purchase separately)	–
IB(NA)0800340ENG	QSCPU Module User's Manual (Hardware)	Overview, specifications, EMC & LVD, loading & installation, error codes, transportation precautions	Yes	–
SH(NA)080613ENG	Safety Application Guide	Overview, application example, risk assessment & safety level, precautions for the use of safety PLCs, safety application example	No (purchase separately)	–
IB(NA)0800344E	CC-Link Safety System Master Module User's Manual (Hardware)	Overview, specifications, mounting & installation, part names & settings, external wiring, external dimensions	Yes	–
SH(NA)080600ENG	CC-Link Safety System Master Module User's Manual	Overview, system configuration, specifications, functions, data link processing time, parameter setting, procedure before starting, programming specifications, troubleshooting	No (purchase separately)	–
IB(NA)0800345E	CC-Link Safety System Remote I/O Module User's Manual (Hardware)	Overview, specifications, part names & settings, mounting & installation, wiring, external dimensions	Yes	–
SH(NA)080612ENG	CC-Link Safety System Remote I/O Module User's Manual	Overview, system configuration, specifications, functions, parameter setting, procedures & settings, programming, maintenance & inspection, troubleshooting	No (purchase separately)	–

Note: Many of these manuals are available by free download from our website, www.meau.com

Ⓐ MELSEC QS Safety CPU Specifications

Model Number		QS001CPU
Stocked Item		S
Control Method		Repeated operation using stored program
I/O Control Mode		Refresh mode
Programming Language(Language Dedicated To Sequence Control)		Relay symbol language, Function block
Processing Speed (Sequence Instruction)	LD X0	0.10 µs
	MOV D0 D1	0.35 µs
Constant Scan (Function For Keeping Regular Scan Time)		1 to 2000ms (Set in one millisecond increment)
Program Capacity (*1)		14k steps (56k bytes)
Memory Capacity (*1)	Program Memory (Drive 0)	128k bytes
	Standard ROM (Drive 4)	128k bytes
Max.Number Of Files Stored	Program Memory	3 (*2)
	Standard ROM	3 (*2)
No. Of Times Of Writing Data Into The Standard ROM		Max.100000 times
No. Of I/O Device Points		6144 points (X/Y0 to 17FF)
No. Of I/O points		1024 points (X/Y0 to 3FF)
Number Of Loadable Modules		4
Available Battery		Q6BAT
Clock Function		Year, month, day, hour, minute, second, day of week (Automatic leap year judgment) Accuracy -3.18 to +5.25s (TYP. +2.14s)/d at 0°C -3.18 to +2.59s (TYP. +2.07s)/d at 25°C -12.97 to +3.63s (TYP. -3.16s)/d at 55°C
Allowable Instantaneous Power Failure Period		Varies depending on the power supply module.
5VDC Internal Current Consumption		0.43A
External Dimensions H x W x D mm (in)		98 x 55.2 x 115 (3.86 x 2.17 x 4.53)
Weight (kg)		0.29
Protection Of Degree		IP2X

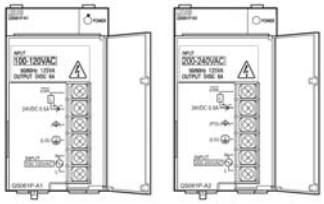
Notes:
1. The maximum number of executable sequence steps is as follows. (Program capacity) - (File header size (default: 34 steps)) For the details, refer to the QSCPU User's Manual (Function Explanation, Program Fundamentals)
2. Parameter, sequence program, SFC program, and device comment files can be stored.



B MELSEC QS Safety Base Unit Specifications

Model Number	QS034B-E
Stocked Item	S
Number Of Slots	4
Applicable Intelligent Function Modules	QS and Q Series communication modules (*1)
5VDC Internal Current Consumption	0.095A
Weight (kg)	0.28
External Dimensions H x W x D mm (in)	98 x 245 x 44.1 (3.86 x 9.65 x 1.74)

Note: Only CC-Link Safety, CC-Link IE, MELSECNET/H and Ethernet modules can be connected.



C MELSEC QS Safety Power Supply Specifications

Model Number		QS061P-A1	QS061P-A2
Stocked Item		S	–
Base Loading Position		QS series power supply module loading slot	
Applicable Base Unit		QS034B	
Input Power Supply		100 to 120VAC +10% -15% (85 to 132VAC)	200 to 240VAC +10% -15% (170 to 264VAC)
Input Frequency		50/60Hz ±5%	
Input Voltage Distortion Factor		Within 5%	
Max. Input Apparent Power		125VA	
Inrush Current		20A within 8ms (*4)	
Rated Output Current	5VDC	6A	
Overcurrent Protection (*1)	5VDC	6.6A or more	
Overvoltage Protection (*2)	5VDC	5.5 to 6.5V	
Efficiency		70% or more	
Allowable Momentary Power Failure Period (*3)		Within 20ms	
Dielectric Withstand Voltage		Across inputs/LG and outputs/FG 1780VAC rms/3 cycles (2000 m (6562 ft.))	Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (2000 m (6562 ft.))
Insulation Resistance		Across inputs/LG and outputs/FG, across inputs and LG, across outputs and FG 10MΩ or more by insulation resistance tester	
Noise Durability		By noise simulator of 1500Vp-p noise voltage, 1µs noise width and 25 to 60Hz noise frequency • Noise voltage IEC61000-4-4, 2kV	
Operation Indication		LED indication (Normal: ON (green), Error: OFF)	
Fuse		Built-in (Not replaceable)	
Contact Output Section	Application	ERR. contact	
	Rated Switching Voltage, Current	24VDC, 0.5A	
	Minimum Switching Load	5VDC, 1mA	
	Response Time	OFF to ON: 10ms max. ON to OFF: 12ms max.	
	Life	Mechanical: More than 20 million times Electrical : More than 100 thousand times at rated switching voltage, current	
	Surge suppressor	No	
	Fuse	No	
Terminal Screw Size		M3.5 screw	
Applicable Wire Size		0.75 to 2mm^2	
Applicable Solderless Terminal		RAV1.25 to 3.5, RAV2 to 3.5 (0.8mm or less thick)	
Applicable Tightening Torque		0.66 to 0.89 N•m	
External Dimensions H x W x D mm (in)		98 x 55.2 x 115 (3.86 x 2.33 x 4.53)	
Weight (kg)		0.40	

Notes:

1. Overcurrent protection. The overcurrent protection function shuts off the 5 VDC circuit and stops the system if the current flowing in the circuit exceeds the specified value. The LED of the power supply module is turned off or lights up in dim green when voltage is lowered. If this device is activated, switch the input power supply off and eliminate the cause such as insufficient current capacity or short. Then, a few minutes later, switch it on to restart the system. The initial start for the system takes place when the current value becomes normal.
2. Overvoltage protection. The overvoltage protection function shuts off the 5 VDC circuit and stops the system if a voltage of 5.5 VDC or above is applied to the circuit. When this device is activated, the power supply module LED is switched OFF. For restart of the system, turn off the input power supply, and then turn on in a few minutes. This allows the system to start up with initial start. If the system does not start up and a LED indication remains off, replacement of a power supply module is required.
3. Allowable momentary power failure period
   • An instantaneous power failure lasting less than 20ms will cause AC down to be detected, but operation will continue.
   • An instantaneous power failure lasting in excess of 20ms may cause the operation to continue or initial start to take place depending on the power supply load.
4. Inrush current. When power is switched on again immediately (within 5 seconds) after power-off, an inrush current of more than the specified value (2ms or less) may flow. Reapply power 5 or more seconds after power-off. When selecting a fuse and breaker in the external circuit, take account of the blowout, detection characteristics and above matters.

Ⓓ Intelligent Function Modules

The QS Safety PLC can be used with the CC-Link Safety Master, MELSECNET/H and Ethernet intelligent function module.

MELSEC QS CC-Link Safety Network Master Specifications

Model Number		QS0J61BT12				
Stocked Item		S				
Transmission Rate		Select from 156kbps/625kbps/2.5Mbps/5Mbps/10Mbps				
Maximum Overall Cable Distance (Maximum Transmission Distance)		1200 meters at 156kpp, 100 meters at 10Mbps				
Maximum No. of Connectable Modules		64 modules				
Maximum No. of Link Points Per System		Remote I/O (RX, RY) : 2048 points • Remote register (RWr) : 256 points (remote device stationmaster station) Remote register (RWw): 256 points (master remote device station)				
Link Points Per Remote Station	Station Type	Safety remote station	Standard remote station			
	Number of Occupied Stations	1 station	1 station	2 stations	3 stations	4 stations
	RX	32 points	32 points	64 points	96 points	128 points
	RY	32 points	32 points	64 points	96 points	128 points
	RWr	0 points	4 points	8 points	12 points	16 points
	RWw	0 points	4 points	8 points	12 points	16 points
Communication Method		Broadcast polling method				
Synchronization Method		Flag synchronous system				
Coding Method		NRZI method				
Transmission Path		Bus (RS-485)				
Transmission Format		HDLC compliant				
Error Control System		CRC32 (*2)				
		CRC16				
Recommended Connection Cable		Version 1.10 compatible CC-Link dedicated cable (*1)				
No. of I/O Occupied Points		32 points (I/O assignment: 32 intelligent points)				
5VDC Internal Current Consumption		0.46A				
Weight (kg)		0.12				

Notes:

1. Use BA1SJ61-S or -P certified CC-Link cable and appropriate terminating resistors.
2. Error detection using CRC32 is not performed for communication with standard remote I/O stations or remote device stations.

MELSEC QS CC-Link Safety Remote I/O Module Specifications

Model Number		QS0J65BTB2-12DT		
Stocked Item		S		
Input Specifications			Output Specifications	
No. of Input Points		8 points (Input terminals: 16 points (*2))	No. of Output Points	4 points (source+ sink) or 2 points (source + source)
Isolation Method		Photocoupler	Isolation Method	Photocoupler
Rated Input Voltage		24VDC	Rated Load Voltage	24VDC
Rated Input Current		Approx. 4.6mA	Operating Load Voltage Range	19.2V to 28.8VDC (Ripple ratio: 5% or less)
Operating Voltage Range		19.2V to 28.8VDC (Ripple ratio: 5% or less)	Max. Load Current	0.5A/point
Max. Simultaneous Input Points		100% (*1)	Max. Inrush Current	1.0A, 10ms or less
ON Voltage / ON Current		15VDC/2mA or more	Leakage Current at OFF	0.5mA or less
OFF Voltage / OFF Current		5VDC/0.5mA or less	Max. Voltage Drop at ON	1.0VDC or less
Input Resistance		Approx. 5.6k Ω	Protection Function	Output overload protection function
Input Type		Negative common (source)	Output Type	Source + sink type Source + source type
Response Time	OFF — ON	0.4ms or less (at 24VDC)	Response Time OFF–ON	0.4ms or less (at 24VDC)
	ON — OFF	0.4ms or less (at 24VDC)	ON–OFF	0.4ms or less (at 24VDC)
Safety Remote Station Input Response Time		32ms or less + filtering time (1ms, 5ms, 10ms, 20ms, 50ms)	Safety Remote Station Output Response Time	32ms or less
			Surge Suppressor	Zener diode
External Power Supply	Voltage	19.2V to 28.8VDC (Ripple ratio: 5% or less)		
	Current	60mA (24VDC, with all points ON, excepting for external load current)		
	Protection Function	External power supply overvoltage/overcurrent protection function		
	Fuse	8A (Not replaceable)		
Wiring Method For Common		16 input points/common, 4 output points/common (Terminal block 2-wire type)		
Common Current		Max. 4A (Total of inputs and outputs)		
No. Of Stations Occupied		1 station		
No. Of Access To Nonvolatile Memory Inside Module		10^{12} times		
Safety Refresh Response Processing Time		38ms		
Module Power (*1)	Voltage	19.2V to 28.8VDC (Ripple ratio: 5% or less)		
	Current	140mA or less (24VDC, with all points ON)		
	Protection Function	Module power overvoltage/overcurrent protection function		
	Fuse	0.8A (Not replaceable)		
	Momentary Power Failure Period	10ms or less		
Noise Immunity		Tested by a DC-type noise simulator with noise voltage of 500Vp-p, noise width of 1μs and frequency of 25 to 60Hz.		
Dielectric Withstand Voltage		500V AC between all external DC terminals and ground, for 1 minute		
Insulation Resistance		10MΩ or more between all external DC terminals and ground, by a 500VDC insulation resistance tester		
Level Of Protection		IP2X		
Weight		0.67kg		
External Connection System	Communication Section, Module Power Section	7-point detachable terminal block [Transmission circuits, module power, FG] M3 x 5.2 Tightening torque: 0.425 to 0.575N•m, 2 solderless terminals or less		
	External Power Supply Section, I/O Section	18-point detachable terminal block x 3 [External power supply, I/O signals] M3 x 5.2 Tightening torque: 0.425 to 0.575N•m, 2 solderless terminals or less		
Module Fixing Screw		M4 screw with polished and round flat washer (Tightening torque: 0.824 to 1.11N•m) Mountable with a DIN rail, and in 6 orientations.		
Applicable DIN Rail		TH35-7.5Fe, TH35-7.5Al (Compliant with JIS C 2812)		
Applicable Cable Size		0.3 to 2.0mm^2		
Applicable Solderless Terminal		RAV1.25-3 (Compliant with JIS C 2805) [Applicable wire size: 0.3 to 1.25mm^2] TGV2-3N (Nichifu) V2-MS3 (JST Mfg. Co., Ltd.), RAP2-3SL(Nippon Tanshi Co., Ltd.) [Applicable wire size: 1.25 to 2mm^2]		
Dimensions (W x H x D) mm		197 x 65 x 74.5		

Notes:

1. The power supply connected to the QS0J65BTB2-12DT must satisfy the following conditions: (1) Reinforced insulation SELV (Safety Extra Low Voltage): Hazardous potential part (48V or more) (2) Compliance with the LVD (Low Voltage Directive) (3) Output voltage within 19.2V to 28.8VDC (Ripple ratio: 5% or less.)
2. Two inputs terminals are assigned for each input since redundant wiring is supported.

MELSEC QS CC-Link Safety Remote I/O Module Specifications

Model Number		QS0J65BTS2-8D	QS0J65BTS2-4T
Stocked Item		S	S
Number of I/O Points		Input: 8 points (input terminals: 16 points) (*2)	Output: 4 points (source + sink), or 2 points (source + source)
Isolation Method		Photocoupler	
Rated Input Voltage		24 VDC	—
Rated Input Current		Approx. 5.9 mA	—
Rated Load Voltage		—	24 VDC
Operating Load Voltage Range		19.2 to 28.8 VDC (ripple ratio: 5% or less)	
Max. No. Simultaneous Input Points		100%	—
ON Voltage / ON Current		15 VDC or more / 2mA or more	—
OFF Voltage / OFF Current		5 VDC or less / 0.5 mA or less	—
Input Resistance		Approx. 4.3kΩ	—
Max. Load Current		—	0.5 A/point
Max. Inrush Current		—	1.0 A 10 ms or less
Leakage Current at OFF		—	0.5 mA or less
Max. Voltage Drop at ON		—	1.0 VDC or less
Protection Function		—	Output overload protection function
Input Type		Negative common (source type)	—
Output Type		—	Source + sink type, Source + source type
Surge Suppressor		—	Zener diode
Response Time	OFF to ON	0.4 ms or less (at 24 VDC)	
	ON to OFF	0.4 ms or less (at 24 VDC)	
Safety Remote Station Input Response Time		11.2 ms or less + time of noise removal filter (1 ms, 5 ms, 10 ms, 20 ms, 50 ms)	10.4 ms or less (ON to OFF), 11.2 ms or less (OFF to ON)
External Power Supply	Voltage	19.2 to 28.8 VDC (ripple ratio: 5% or less)	
	Current	40 mA (at 24 VDC, all points ON, not including external load current)	45 mA (at 24 VDC, all points ON, not including external load current)
	Protection Function	External power supply overvoltage/overcurrent protection function	
	Fuse	8 A (not replaceable)	
Wiring Method for Common		16 input points/common (spring clamp terminal block 2-wire type)	4 output points/common (spring clamp terminal block 2-wire type)
Common Current		—	Max. 2 A
Number of Occupied Stations		1 station	
Number of Writes to Nonvolatile Memory Inside Module		10^{12} times	
Safety Refresh Response Processing Time		9.6 ms	
Module Power (*1)	Voltage	19.2 to 28.8 VDC (ripple ratio: 5% or less)	
	Current	120 mA or less (24 VDC, all points ON)	95 mA or less (24 VDC, all points ON)
	Protection Function	Module power supply overvoltage/overcurrent protection function	
	Fuse	0.8 A (not replaceable)	
	Momentary Power Failure Period	10 ms or less	
Noise Immunity		By DC-type noise simulator of 500 Vp-p noise voltage, 1 µs pulse width, and 25 to 60 Hz noise frequency	
Dielectric Withstand Voltage		500 V AC between all external DC terminals and ground, for 1 minute	
Insulation Resistance		10 MΩ or more between all external DC terminals and ground, by a 500 VDC insulation resistance tester	
Degree of Protection		IP2X	
Weight		0.46 kg	0.45 kg
External Connections	Communication, Module Power Supply	7-point detachable terminal block [transmission circuits, module power supply, FG] M3 x 5.2; tightening torque: 0.425 to 0.575 N•m, 2 crimping terminals or less	
	External Power Supply, Input	Two-piece spring clamp terminal block [external power supply, input signal]	
Modular Mounting Screw		M4 screw with polished, round flat washer (tightening torque: 0.824 to 1.11 N·m); mountable with a DIN rail, and in 6 orientations	
Applicable DIN Rail		TH35-7.5Fe, TH35-7.5Al (JIS C 2812 compliant)	
Applicable Wire Size	Communication, Power Supply	0.3 to 2.0mm²	
	Applicable Crimping Terminal	RAV1.25-3 (JIS C 2805 compliant) [applicable wire size: 0.3 to 1.25 mm²] V2-MS3 (JST Mfg. Co., Ltd.), RAP2-3SL (Nippon Tanshi Co., Ltd.); TGV2-3N (Nichifu) [applicable wire size: 1.25 to 2 mm²]	
	External Power Supply, Input	Twisted wire 0.08 to 1.5 mm² (28 to 16 AWG) (*3) Applicable wire strip length: 8 to 11 mm	
	Applicable Crimping Terminal	TE0.5 (Nichifu) [applicable wire size: 0.5 mm²]· TE0.75 (Nichifu) [applicable wire size: 0.75 mm²]· TE1 (Nichifu) [applicable wire size: 0.9 to 1.0 mm²] TE1.5 (Nichifu) [applicable wire size: 1.25 to 1.5 mm²]· FA-VTC125T9 (Mitsubishi Electric Engineering Co., Ltd. [applicable wire size: 0.3 to 1.65 mm²] FA-VTCW125T9 (Mitsubishi Electric Engineering Co., Ltd. [applicable wire size: 0.3 to 1.65 mm²]	
Dimensions (W x H x D) mm		163 x 98 x 85	197 x 65 x 74.5

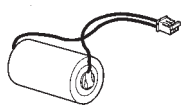
Notes:

1. The power supply connected to the QS0J65BTB2-8D and QS0J65BTS2-4T must satisfy the following conditions:
(1) SELV (Safety Extra Low Voltage): Reinforced insulation from hazardous potential part (48 V or more) required.
(2) Compliance with the LVD (Low Voltage Directive).
(3) Output voltage must be 19.2 to 28.8 V DC (ripple ratio: 5% or less).

2. Two input terminals are assigned for each input since dual wiring is supported.

3. Do not insert two or more wires into one terminal.

E CPU Replacement Battery

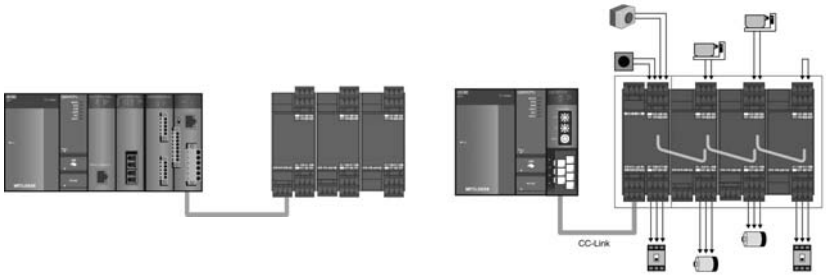


All Q Series CPUs employ RAM based memory. To insure this is preserved after power down, use Q6BAT. Note these are not compatible with the A6BAT. Any RAM based memory cards installed in the CPU use the Q2MEM-BAT for back-up and are independent of the Q6BAT. One Q6BAT is shipped with each CPU.

Model Number	Q6BAT
Stocked Item	S

F Safety Relay Modules

Function	Description
Dual Input Function	Prevents damage of the safety functions due to a single failure by doubling inputs. Input N type: Dual input with positive common and negative common Input P type: Dual input with positive commons In the case of input N type, when a short circuit occurs between the dual inputs, a short circuit occurs between the power supply and grounding. Therefore, power goes off by the electric fuse.
Start-Up/Off Check Function	Checks that status of the safety relay module and external device are normal.
Start-Up Method Selection Function	Checks that status of the safety relay module and external device are normal.
Monitor Function	Allows to check operating status of the whole safety relay modules including extension safety relay modules by connecting to the programmable controller using programming tool.
Partial Shutdown Function With Extension Module	Allows to shut off outputs of a certain module by using safety inputs of extension module.



Safety Relay Module Specifications

Model Number		Q Series Safety Relay Module		CC-Link Safety Relay Module		Extension Safety Relay Module	
		QS90SR2SP-Q	QS90SR2SN-Q	QS90SR2SP-CC	QS90SR2SN-CC	QS90SR2SP-EX	QS90SR2SN-EX
Stocked Item		S	S	S	S	S	S
Applicable Safety Standard		EN954-1 Category 4, ISO13849-1 PL e					
Number of Safety Input Points		1 point (2 inputs)					
Number of Start-Up Input Points		1 point					
Number of Safety Output Points		1 point (3 outputs)					
Rated Load Current		Category 4: 3.6 A/point or less, Category 3: 5.0 A/point or less (250 VAC/30 VDC)					
Response Time	Time Until Output OFF	20 ms or less (safety input OFF to safety output OFF)					
	Time Until Output ON	50 ms or less (safety input ON to safety output ON)					
Module Power Supply		20.4 to 26.4 VDC (ripple ratio: 5% or less)		20.4 to 26.4 VDC (ripple ratio: 5% or less)		Supplied from Q Series safety relay module or CC-Link safety relay module.	
Safety Power Supply		20.4 to 26.4 VDC (ripple ratio: 5% or less)		20.4 to 26.4 VDC (ripple ratio: 5% or less)		Supplied from Q Series safety relay module or CC-Link safety relay module.	
Number of Extension Modules		Max. 3 extension safety relay modules		Max. 3 extension safety relay modules		N/A	
External Connections		Two-piece spring clamp terminal block					
Relay Life	Mechanical	5,000,000 times or more					
	Electrical	100,000 times or more					
Input Type		P type (dual input with positive commons)	N type (dual input with positive common and negative common)	P type (dual input with positive commons)	N type (dual input with positive common and negative common)	P type (dual input with positive commons)	N type (dual input with positive common and negative common)

Safety Relay Module Extension Cables

Model Number	QS90CBL-SE01	QS90CBL-SE15
Stocked Item	S	S
Cable Length (m)	0.1	1.5